

**DAQ-2012-018261**

UTAH STATE PLAN  
FOR  
IMPLEMENTATION OF EMISSION CONTROLS FOR  
EXISTING DESIGNATED FACILITIES

**SECTION II, PLAN FOR  
HOSPITAL, MEDICAL, INFECTIOUS WASTE INCINERATORS (HMIWI)**

**Implementation of 40 CFR 60 Sub-part Ce [60.30e - 60.39e]**

Adopted by the Air Quality Board  
March 7, 2012

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## Preface

This Plan contains operational requirements for all existing incinerators in Utah that burn or have been burning medical, hospital, or infectious waste or any combination of them. “Operational requirements” means the requirements of all sections of this Plan and R307-222. Existing incinerators are those for which construction was commenced on or before June 20, 1996; for which modification was commenced on or before March 16, 1998 and for which construction was commenced after June 20, 1996 but no later than December 1, 2008; or for which modification was commenced after March 16, 1998 but no later than April 6, 2010 whether or not they have been identified in this Plan.

The authority for the Plan comes from 40 CFR 60, Subpart Ce, and Emission Guidelines, promulgated by EPA on September 15, 1997 and as amended @ 74 FR 51403, October 6, 2009. 40 CFR 60, Subpart Ce contains ten sections identified numerically as 60.30e through 60.39e. The Plan addresses the requirements of each of these ten sections.

Five points must be emphasized here. See the text for these and other requirements.

1. There is no exemption from this Plan on the basis of waste feed rates or the size of the incinerator.
2. Within one year after EPA has approved this Plan, all affected facilities, whether or not they have been identified in this Plan, shall be in compliance or shall have applied for an extension or shall be shut down.
3. If the source is unable to meet the emissions limitations in its present configuration, the source may petition for an extension in order to retrofit, to make arrangements for off-site disposal, or to install other equipment for sterilization of waste. The petition shall explain why additional time will be needed to come into compliance, and shall analyze alternative measures.
4. All affected facilities shall be in compliance no later than October 6, 2014.
5. All affected sources, whether or not they have been identified in this Plan, are subject to the requirements of this Plan and R307-222.

Information contained in the appendices is an integral part of the Plan, and shall be used and adhered to as appropriate.

## Summary of Requirements

**The Act of Congress:** The Congress of the United States authorized EPA to develop standards and guidelines to govern the operation of new and existing incinerators that burn hospital, medical, or infectious waste, and the states to develop a plan to implement the standards and the guidelines. See the Clean Air Act, sections 111(d) and 129 (42 U.S.C. 7411(d) and 7429).

**The EPA's Action:** On September 15, 1997, EPA promulgated a set of guidelines for the existing incinerators, and codified it in 40 CFR 60 Subpart Ce. This subpart was amended @74 FR 51403 on October 6, 2009.

**Applicability of the State Plan and Rules:** This Plan and R307-222 apply to all affected facilities.

**Affected Facilities:** All incinerators in Utah, whether or not identified in the Plan, are affected facilities if they have the intent to burn hospital, medical, or infectious waste or any combination of them and if construction was commenced on or before June 20, 1996; for which modification was commenced on or before March 16, 1998 and for which construction was commenced after June 20, 1996 but no later than December 1, 2008; or for which modification is commenced after March 16, 1998 but no later than April 6, 2010. The exceptions to this are discussed in Part A.3 in the Plan.

**Incinerators with Limited Compliance Requirements:** Certain incinerators are regulated under other provisions and not by this Plan. See Part A.2.

**Incinerator's Compliance Schedule:** All incinerators subject to the Plan shall comply with the requirements of the Plan -- emissions limits, performance testing, operator training, record keeping, etc -- within one year after EPA's approval of the state's Plan. If the source chooses to shut down instead, the shutdown shall be complete no later than one year after EPA approval of this Plan, and proof of the shutdown shall be submitted no later than that date. The proof shall include evidence of removal of the chamber, or evidence that all the following actions have been completed:

- Welding of the waste charge door,
- Removal of the stack, or the bypass,
- Removal of the combustion blower,
- Removal of the burner(s), and
- Removal of the fuel supply.

**Infeasibility of Compliance on Time:** Should the one-year compliance date be infeasible for a source, the source may petition for an extension and include a compliance plan. The extension may be used to arrange for offsite disposal if that option is not yet available; to arrange for other equipment, such as an autoclave, to replace the incinerator; or to retrofit the incinerator with pollution control equipment able to demonstrate compliance. The compliance plan accompanying a petition to retrofit shall include the incremental steps and dates found in Part K.3 of the Plan.

The petition shall include at least the following information:

- A justification for being unable to comply on time;
- A detailed compliance plan;
- Dates for accomplishing the following steps to compliance:
  - \* Negotiate contract for air pollution control equipment or process modification;
  - \* Award of contract;
  - \* Initiate on-site construction;
  - \* Complete on-site construction or installation of air pollution equipment or process changes;
  - \* Redesign, manufacture, install, and test. The compliance date for this option will be no later than October 6, 2014, or, three years after the date of approval of the State Plan, whichever is earlier.
- Date of final compliance.

**Training and Qualification:** Incinerator operators shall receive training as delineated in the Plan, pass an examination, and qualify as specified in Part D.

**Title V -- Operating Permit:** All incinerators subject to the Plan are subject 40 CFR Part 70 and R307-415. This means that each such source shall submit an operating permit application no later than September 15, 2000. The Operating Permit application for sources that opt to come into compliance by applying “incremental steps of progress” shall include all incremental steps of progress, including a schedule.

**Missed Schedule:** Sources discovered well into the compliance time, or already having missed several increments of progress, shall be shut down until they have caught up.

**Operation of Previously Shut-Down Incinerators:** Any previously shut-down incinerator shall remain shut down unless it can meet the requirements of the Plan.

**Consequences of Non-Compliance:** Any incinerator that cannot comply with the requirements of the Plan shall shut down.

### Schedule for Compliance with the HMIWI Plan

ACTIVITY	COMPLIANCE DATE	COMPLIANCE WITH EXEMPTION
1. Show compliance within one year after EPA approval of this Plan, or petition for extension in which to arrange for offsite incineration or disposal, to install alternative equipment, or to retrofit the incinerator. The petition shall include a compliance plan including steps and enforceable dates to compliance.		January 6, 2014
2. Show compliance or shut down	Within one year after EPA approval of Plan, but no later than October 6, 2014	
A. Operator training complete		
B. Inspection complete (small rural HMIWI)		
C. Initial compliance testing complete		
D. Begin monitoring operating parameters		
E. Begin reporting		
F. Begin recordkeeping		
G. Submit application for operating permit	October 6, 2014	
3. If the petition for extension is granted to arrange for offsite disposal or to install alternative equipment, the incinerator shall follow its compliance plan including dates for compliance.		
4. If the petition for extension to retrofit is granted, the incinerator shall meet the compliance dates for the following incremental steps:		
a. Award contracts for control plan		May 6, 2013
b. Initiate construction or installation of control equipment		January 6, 2014
c. Submit application for operating permit	Within one year after EPA approval of Plan, but no later than October 6, 2014	October 6, 2014
d. Complete construction or installation of control equipment		August 6, 2014
e. Complete initial compliance test		October 6, 2014

f. Be in compliance, including completion of operator training and initial performance testing.		No later than 3 years after Plan approval, or October 6, 2014, whichever is earlier.
5. Submit performance test data.	If in compliance by compliance date, test annually. If emission limits or operating parameters are exceeded after compliance date, test semiannually.	
6. Repeat performance test	Within 12 months following initial compliance test and annually thereafter.	
7. Parameter monitoring	Continuously, upon completion of initial compliance test.	
8. Recordkeeping	Continuously, upon completion of initial compliance test.	
9. Reporting	Annually, upon completion of initial compliance test; semiannually, if noncompliance.	



**Definitions**  
**[40 CFR Part 60, Sec. 60.51c]**

**Batch HMIWI** means an HMIWI that is designed such that neither waste charging nor ash removal can occur during combustion.

**Biologicals** means preparations made from living organisms and their products, including vaccines, cultures, etc., intended for use in diagnosing, immunizing, or treating humans or animals or in research pertaining thereto.

**Blood Products** means any product derived from human blood, including but not limited to blood plasma, platelet, red or white blood corpuscles, and other derived licensed products, such as interferon, etc.

**Body Fluids** means liquid emanating or derived from humans and limited to blood; dialysate; amniotic, cerebrospinal, synovial, pleural, peritoneal and pericardial fluids; and semen and vaginal secretions.

**Bypass stack** means a device used for discharging combustion gases to avoid severe damage to the air pollution control device or other equipment.

**Chemotherapeutic waste** means waste material resulting from the production or use of antineoplastic agents used for the purpose of stopping or reversing the growth of malignant cells.

**Co-fired combustor** means a unit combusting hospital waste and/or medical/infectious waste with other fuels or wastes (e.g., coal, municipal solid waste) and subject to an enforceable requirement limiting the unit to combusting a fuel feed stream, 10% or less of the weight of which is comprised, in aggregate, of hospital waste and medical/infectious waste as measured on a calendar quarter basis. For purposes of this definition, pathological waste, chemotherapeutic waste, and low-level radioactive waste are considered "other" wastes when calculating the percentage of hospital waste and medical/infectious waste combusted.

**Continuous emission monitoring system or CEMS** means a monitoring system for continuously measuring and recording the emissions of a pollutant from an affected facility.

**Continuous HMIWI** means an HMIWI that is designed to allow waste charging and ash removal during combustion.

**Dioxins/furans** means the combined emissions of tetra-through octa-chlorinated di-benzo-para-Dioxins and dibenzofurans, as measured by EPA Reference Method 23.

**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.

**Fabric filter or baghouse** means an add-on air pollution control system that removes particulate matter (PM) and non-vaporous metals emissions by passing flue gas through filter bags.

**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.

**High-air phase** means the stage of the batch operating cycle when the primary chamber reaches and maintains maximum operating temperatures.

**Hospital** means any facility which has an organized medical staff, maintains at least six inpatient beds, and where the primary function of the institution is to provide diagnostic and therapeutic patient services and continuous nursing care primarily to human inpatients who are not related and who stay on average in excess of 24 hours per admission. This definition does not include facilities maintained for the sole purpose of providing nursing or convalescent care to human patients who generally are not acutely ill but who require continuing medical supervision.

**Hospital waste** means discards generated at a hospital, except unused items returned to the manufacturer. The definition of hospital waste does not include human corpses, remains, and anatomical parts intended for interment or cremation.

**Infectious agent** means any organism (such as a virus or bacteria) that is capable of being communicated by invasion and multiplication in body tissues and capable of causing disease or adverse health impact in humans.

**Intermittent HMIWI** means an HMIWI that is designed to allow waste charging, but not ash removal, during combustion.

**Large HMIWI means:**

(1) Except as provided in (2);

(i) An HMIWI whose maximum design waste burning capacity is more than 500 pounds per hour; or

(ii) A continuous or intermittent HMIWI whose maximum charge rates more than 500 pounds per hour; or

(iii) A batch HMIWI whose maximum charge rate is more than 4,000 pounds per 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 pounds per hour; or

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

**Low-level radioactive waste** means waste material which contains radioactive nuclides emitting primarily beta or gamma radiation, or both, in concentrations or quantities that exceed applicable federal or state standards for unrestricted release. Low-level radioactive waste is not high-level radioactive waste, spent nuclear fuel, or by-product material as defined by the Atomic Energy Act of 1954 (42 U.S.C. 2014(e)(2)).

**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. During periods of malfunction the operator shall operate within established parameters as much as possible, and monitoring of all applicable operating parameters shall continue until all waste has been combusted or until the malfunction ceases, whichever comes first.

**Maximum charge rate means:**

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

**Maximum design waste burning capacity means:**

(1) For intermittent and continuous HMIWI,

$C = (P_v)(15,000/8,500)$  Where:

C = HMIWI capacity, lb/hr

$P_v$  = primary chamber volume,  $ft^3$ ;

15,000 = primary chamber heat release rate factor, Btu/ $ft^3$ /hr

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

(2) For batch HMIWI,

$C = (P_v)(4.5/8)$  Where:

C = HMIWI capacity, lb/hr

$P_v$  = primary chamber volume,  $ft^3$

4.5 = waste density, lb/ $ft^3$

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

**Maximum fabric filter inlet temperature** means 110% 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 dioxin/furan emission limit.

**Maximum flue gas temperature** means 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.

**Medical/infectious waste** means any waste generated in the diagnosis, treatment, or immunization of human beings or animals, in research pertaining thereto, or in the production or testing of biologicals that are listed in paragraphs (1) through (7) of this definition. The definition of medical/infectious waste does not include hazardous waste identified or listed under the regulations in 40 CFR Part 261; household waste as defined in Sec. 261.4(b)(1); ash from incineration of medical/infectious waste, once the incineration process has been completed; human corpses, remains, and anatomical parts that are intended for interment or cremation; and domestic sewage materials identified in Sec. 261.4(a)(1).

(1) Cultures and stocks of infectious agents and associated biologicals, including: cultures from medical and pathological laboratories; cultures and stocks of infectious agents from research and industrial laboratories; wastes from the production of biologicals; discarded live and attenuated vaccines; and culture dishes and devices used to transfer, inoculate, and mix cultures.

(2) Human pathological waste, including tissues, organs, and body parts and body fluids that are removed during surgery or autopsy, or other medical procedures, and specimens of body fluids and their containers.

(3) Human blood and blood products including:

(i) Liquid waste human blood;

(ii) Products of blood;

(iii) Items saturated and/or dripping with human blood; or

(iv) Items that were saturated and/or dripping with human blood that are now caked with dried human blood; including serum, plasma, another blood components, and their containers, which were used or intended for use in either patient care, testing and laboratory analysis or the development of pharmaceuticals. Intravenous bags are also included in this category.

(4) Sharps that have been used in animal or human patient care or treatment or in medical, research, or industrial laboratories, including hypodermic needles, syringes (with or without the attached needle), Pasteur pipettes, scalpel blades, blood vials, needles with attached tubing, and culture dishes (regardless of presence of infectious agents). Also included are other types of broken or unbroken glassware that were in contact with infectious agents, such as used slides and cover slips.

(5) Animal waste including contaminated animal carcasses, body parts, and bedding of animals that were known to have been exposed to infectious agents during research (including research in veterinary hospitals), production of biologicals or testing of pharmaceuticals.

(6) Isolation wastes including biological waste and discarded materials contaminated with blood, excretions, exudates, or secretions from humans who are isolated to protect others from certain highly communicable diseases, or isolated animals known to be infected with highly communicable diseases.

(7) Unused sharps including the following unused, discarded sharps: hypodermic needles, suture needles, syringes, and scalpel blades.

**Medium HMIWI means:**

(1) Except as provided in paragraph (2);

- (i) An HMIWI whose maximum design waste burning capacity is more than 200 pounds per hour but less than or equal to 500 pounds per hour; or
- (ii) A continuous or intermittent HMIWI whose maximum charge rates more than 200 pounds per hour but less than or equal to 500 pounds per hour; or
- (iii) A batch HMIWI whose maximum charge rate is more than 1,600 pounds per day but less than or equal to 4,000 pounds per 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 pounds per hour or more than 500 pounds per hour; or
- (ii) A batch HMIWI whose maximum charge rate is more than 4,000 pounds per day or less than or equal to 1,600 pounds per day.

**Minimum dioxin/furan sorbent flow rate** means 90% of the highest three-hour average dioxin/furan sorbent flow rate (taken, at minimum, once every hour) measured during the most recent performance test demonstrating compliance with the dioxin/furan emission limit.

**Minimum mercury Hg sorbent flow rate** means 90% 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.

**Minimum hydrogen chloride (HCL) sorbent flow rate** means 90% of the highest three -hour average HCL sorbent flow rate (taken, at minimum, once every hour) measured during the most recent performance test demonstrating compliance with the HCL emission limit.

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

**Minimum pressure drop across the wet scrubber** means 90% 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.

**Minimum scrubber liquor flow rate means** 90% of the highest-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.

**Minimum scrubber liquor pH means** 90% of the highest three-hour average liquor pH at the inlet to the wet scrubber (taken, at minimum, once every minute) measured during the most recent performance test demonstrating compliance with the HCL emission limit.

**Minimum secondary chamber temperature means** 90% of the highest three-hour average secondary chamber temperature (taken, at minimum, once every minute) measured during the most recent performance test demonstrating compliance with the PM, CO, or dioxin/furan emission limits.

**Modification or Modified HMIWI means** any change to an 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% 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.

**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.

**Operation means** the period during which waste is combusted in the incinerator excluding periods of startup or shutdown.

**Particulate matter or PM means** the total particulate matter emitted from an HMIWI as measured by EPA Reference Method 5 or EPA Reference Method 29.

**Pathological waste means** waste material consisting of only human or animal remains, anatomical parts, and/or tissue, the bags/containers used to collect and transport the waste material, and animal bedding (if applicable).

**Primary chamber means** the chamber in an HMIWI that receives waste material, in which the waste is ignited, and from which ash is removed.

**Pyrolysis means** the endothermic gasification of hospital waste and/or medical/infectious waste using external energy.

**Secondary chamber means** a component of the HMIWI that receives combustion gases from the primary chamber and in which the combustion process is completed.

**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.

**Small HMIWI means:**

(1) Except as provided in (2);

- (i) An HMIWI whose maximum design waste burning capacity is less than or equal to 200 pounds per hour; or
- (ii) A continuous or intermittent HMIWI whose maximum charge rates less than or equal to 200 pounds per hour; or
- (iii) A batch HMIWI whose maximum charge rate is less than or equal to 1,600 pounds per day.

(2) The following are not small HMIWI:

- (i) A continuous or intermittent HMIWI whose maximum charge rate is more than 200 pounds per hour;
- (ii) A batch HMIWI whose maximum charge rate is more than 1,600 pounds per day.

**Standard conditions** means a temperature of 20 deg. C and a pressure of 101.3 kilo-Pascal.

**Startup means** the period of time between the activation of the system and the first charge to the unit. For batch HMIWI, startup means the period of time between activation of the system and ignition of the waste.

**Wet scrubber means** an add-on air pollution control device that utilizes an alkaline scrubbing liquor to collect particulate matter (including non-vaporous metals and condensed organic) and/or to absorb and neutralize acid gases.

## A. INTRODUCTION

On September 15, 1997, the United States Environmental Protection Agency [EPA] promulgated guidelines and standards to govern the operation of existing and new incinerators that burn hospital, medical, or infectious waste, or any combination of these. Incinerators for which construction began before June 20, 1996 are considered “existing.” They may be subject to the provisions of 40 CFR Part 60, Sub-part Ce, entitled *Emission Guidelines and Compliance Times for Hospital/Medical/Infectious Waste Incinerators*, and subject to Plans developed by the states as required in the Guidelines. New incinerators -- those for which construction began after June 20, 1996, or old ones modified after March 16, 1998 -- may be subject to 40 CFR Part 60, Sub-part Ec, entitled *Standards of Performance for Hospital/Medical/Infectious Waste Incinerators for Which Construction is Commenced after June 20, 1996*. Both the guidelines and the standards exempt certain incinerators either by what they burn or by their mode of operation. Part A.3 of the Plan identifies these.

This Plan addresses only the existing units that are not exempt as explained in Part A.3.

The standards and guidelines regulate emissions of pollutants considered to be carcinogenic or capable of causing toxic effects following exposure at sufficient concentrations. The regulated pollutants are:

Particulate Matter (PM)	Cadmium (Cd)
Sulfur Dioxide (SO <sub>2</sub> )	Mercury (Hg)
Hydrogen Chloride (HCl)	Dioxins
Oxides of Nitrogen (NO <sub>x</sub> )	Dibenzofurans (furans)
Carbon monoxide (CO)	Fugitive ash emissions
Lead (Pb)	Opacity

These emission limits are designed to bring all incinerators subject to them up to the level of emissions control achieved by those that are already well-controlled, commonly called Maximum Achievable Control Technology Standards (MACT). As required in the Clean Air Act, EPA has set the performance standards to challenge the industry to meet or exceed the standards achieved by better controlled similar facilities. This provides a basic level of health protection for all communities while holding down the cost of controls to levels already absorbed by similar operations.

The guidelines set emission limits for incinerators based on their waste charging practice, and the capacity classification reflects design differences in the incinerators. In addition to large, medium and small operations, the guidelines also allow a fourth category of special emission limits for small incinerators located in rural areas.

The chief purpose of the guidelines is to charge both the states and the owners or operators of affected incinerator units with a set of obligations and responsibilities. It is the responsibility of each state to ensure that the designated facilities operating within their borders meet the established requirements, and states are required to develop a plan to implement the requirements. Owners and operators are required to meet HMIWI regulations promulgated by EPA on September 15, 1997 and amendments to the regulations as promulgated on October 6, 2009. The owners or operators of affected incinerator units shall meet the emission guidelines established and emission limits in Table 1A or Table 1B for small rural incinerators or Table 4A or Table 4B for all other incinerators designated as large, medium and small, or else shut down their incinerator.



## **1. Designated Facilities: Is your incinerator subject to the Plan?**

“Designated facility” means each individual HMIWI unit for which construction began before June 20, 1996, or for which modification was commenced on or before March 16, 1998; for which construction was commenced after June 20, 1996 but no later than December 1, 2008; or for which modification is commenced after March 16, 1998 but no later than April 6, 2010. All designated facilities in Utah are subject to the provisions of this Plan, unless their operations fall into one or more of the categories in subsections A.2 or A.3 of the Plan. Some of these facilities shall comply with a limited set of requirements specified in subsection A.2. Those identified in A.3 are exempt from this Plan entirely.

## **2. Incinerator Categories with Limited Compliance Requirements.**

- (a) A facility which burns exclusively pathological waste, low-level radioactive waste, chemotherapeutic waste, or a combination of these, is exempt from the requirements of this Plan. However the facility shall notify the executive secretary of an exemption claim by submitting the appropriate form available from the executive secretary, within one year after EPA approval of this Plan. The facility shall keep records on a calendar quarter basis of the period of the time when only pathological waste, low-level radioactive waste, or chemotherapeutic waste, or a combination of these was burned.
- (b) A co-fired combustor also is exempt from other requirements of this Plan. However, each unit shall submit the appropriate form available from the executive secretary within one year after EPA approval of this Plan in order to provide to the executive secretary an estimate of the relative weight of each hospital, medical or infectious waste and other fuels or waste to be burned. The combustor also shall keep records on a calendar quarter basis of the weight of each of hospital, medical or infectious waste and the weight of all other fuel or waste burned in the co-fired combustors.

## **3. Exempt Units.**

Any pyrolysis unit is exempt from this Plan.

Combustors subject to 40 CFR 60, Subparts Cb, Ea, or Eb are exempt from this Plan. These are federal guidelines and standards that govern the operation of certain municipal waste combustors.

Combustors required to have a permit under Section 3005 of the Solid Waste Disposal Act are exempt from this Plan.

Cement kilns burning hospital, medical or infectious waste or any combination of them are exempt from this Plan.

## **4. Responsibilities of Owners and Operators.**

It is the responsibility of the owners or operators to comply with the requirements of R307-222 and this Plan. The owner or operator of the designated facility shall do the following:

- (a) Provide the Division of Air Quality (DAQ) with the 2010 emission inventory and other information requested by the DAQ.
- (b) Develop a compliance plan, including the relevant schedules.
- (c) Upgrade or retrofit to achieve compliance with the requirements of the Plan.

- (d) Apply for a modification to the current operating permit required under R307-415.
- (e) Comply with all R307 rules.
- (f) Submit an emission inventory annually to DAQ

## **5. EPA's Responsibility**

Section 129 of the 1990 Clean Air Act Amendments authorizes EPA to review, approve, or reject the state's Plan. EPA is expected to approve or reject the Plan no later than 180 days after the state Plan submittal. The EPA also provides appropriate information to assist the states and local agencies to develop a complete and acceptable plan. If the State is unable or unwilling to submit a Plan that would meet EPA's approval, the law authorizes EPA to write and enforce a federal Plan.

## **B. HMIWI DESIGNATED FACILITIES IN UTAH.**

Utah's designated facilities subject to the requirements of the Plan and R307-222 include, but are not limited to, the sources listed in Appendix A of this Plan. The Division of Air Quality identified only one source that does burn hospital, medical or infectious waste.

On December 8, 2011, a copy of the draft State Plan was mailed to the incinerator operator for their review.

## **C. COMPLIANCE BY RETROFIT OR SHUTDOWN.**

All incinerators shall be in compliance no later than three years from EPA approval of this Plan, or October 6, 2014, whichever is earlier. Each incinerator shall demonstrate compliance by shutting down, by meeting all requirements of R307-222 and this Plan including operator training and performance testing, or by being granted an extension by the executive secretary of the Air Quality Board.

To receive an extension, the owner or operator shall submit a petition to the executive secretary no later than October 6, 2012. Materials which shall accompany the petition are specified in Part K of this Plan.

## **D. TRAINING AND QUALIFICATION OF OPERATORS.**

Each designated facility shall have at least one operator, one operational supervisor, or one technical manager who is fully trained and qualified according to the training and qualification program stated below in this Plan. Whenever the incinerator is in operation, the trained person shall be either on the job or shall be able to reach the incinerator within one hour. One operator of each designated facility shall have completed training and qualification within one year after EPA's approval of this Plan.

### **1. Training.**

At least one person responsible for the operation of an incinerator, either an operator or a supervisor, shall receive 24 hours of training, be tested, and be qualified in the following areas.

- (a) Environmental concerns, including pathogen destruction and types of emissions;
- (b) Basic combustion principles, including products of combustion;
- (c) Operation of the type of incinerator to be used by the operator, including proper startup, waste charging, and shutdown procedures;
- (d) Combustion controls and monitoring;
- (e) Operation of air pollution control equipment and factors affecting performance;
- (f) Methods to monitor pollutants (continuous emission monitoring systems and monitoring of incinerators and air pollution control device operating parameters) and equipment calibration procedures;
- (g) Inspection and maintenance of the HMIWI, air pollution control devices, and continuous emission monitoring systems;
- (h) Actions to correct malfunctions or conditions that may lead to malfunction;
- (i) Bottom ash and fly ash characteristics and handling procedures;
- (j) Applicable federal, state, and local regulations, including those contained in 40 CFR 60 Subparts Ce, R307-222, and this Plan.
- (k) Work safety procedures;
- (l) Pre-startup inspections; and
- (m) Record keeping requirements.

The instructor shall design and administer an examination to the incinerator operator and shall have at least one year of experience during the last two years as an HMIWI operator. The test results from the examination should demonstrate competence of the areas covered in Part D.1.(a-m). The reference material covering the course topics shall be distributed to the attendees.

### **2. Qualification.**

- (a) An HMIWI incinerator operator is qualified upon satisfying the following:
  - (i) Completion of a training course that satisfies the criteria under Part D.1 of this Plan, and
  - (ii) 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.

- (b) Qualification shall remain valid for one year from the date on which the examination is passed or the completion of the required experience, whichever is later.
- (c) 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:
  - (i) Update of regulations;
  - (ii) Incinerator operation, including startup and shutdown procedures;
  - (iii) Inspection and maintenance;
  - (iv) Responses to malfunctions or conditions that may lead to malfunction; and
  - (v) Discussion of operating problems encountered by attendees.
- (d) A lapsed qualification shall be renewed by one of the following methods:
  - (i) For a lapse of less than three years, the HMIWI operator shall complete and pass a standard annual refresher course described in subsection (c) above.
  - (ii) For a lapse of three years or more, the HMIWI operator shall complete and pass a training course with the minimum criteria described in Part D(1), items (a) through (m).
- (e) The owner or operator of a [n] designated facility shall maintain documents at the facility that address the following. The documents shall be accessible to the operators:
  - (i) Summary of the applicable requirements, including a copy of this Plan and R307-222;
  - (ii) Description of basic combustion theory applicable to an HMIWI;
  - (iii) Procedures for receiving, handling, and charging waste;
  - (iv) HMIWI startup, shutdown, and malfunction procedures;
  - (v) Procedures for maintaining proper combustion air supply levels;
  - (vi) Procedures for operating the HMIWI and associated air pollution control systems within the requirements of this Plan.
  - (vii) Procedures for responding to periodic malfunction or conditions that may lead to malfunction;
  - (viii) Procedures for monitoring HMIWI emissions;
  - (ix) Reporting and record keeping procedures; and
  - (x) Procedures for handling ash.
- (f) The owner or operator of a designated facility shall establish a program for reviewing annually the information listed in (e) above with each HMIWI operator.
  - (i) The operator shall complete the initial review of the information listed in (e) above before assuming responsibilities that will affect HMIWI operation.
  - (ii) Subsequent reviews of the information listed in (e) above shall be conducted annually with each operator.
- (g) The information listed in (e) above 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 executive secretary's representative upon request.

## **E. REQUIREMENTS FOR AN OPERATOR'S WASTE MANAGEMENT PLAN.**

### **1. Due Date.**

The owner or operator of each designated facility, including, but not limited to, those listed in Appendix A of this Plan, shall prepare a waste management plan. It shall be submitted to the executive secretary no later than 60 days after the incinerator facility has undergone its initial performance test, or 60 days after the date the test was due, whichever is earlier.

### **2. Components of the Waste Management Plan.**

- (a) 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 to reduce the amount of toxic emissions from incinerated waste. A waste management plan shall include, but shall not be limited to:
  - (i) Recycling such waste material as paper, cardboard, plastics, glass, batteries, food waste or metal; and
  - (ii) Purchasing recycled or recyclable products.
- (b) A waste management plan may include different goals or approaches for different areas or departments of the facility. The plan 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.
- (c) In developing a waste management plan, the operator shall consider the American Hospital Association publication entitled "*An Ounce of Prevention: Waste Reduction Strategies for Health Care Facilities.*"

## **F. SMALL INCINERATORS IN RURAL LOCATIONS.**

### **1. General Requirements.**

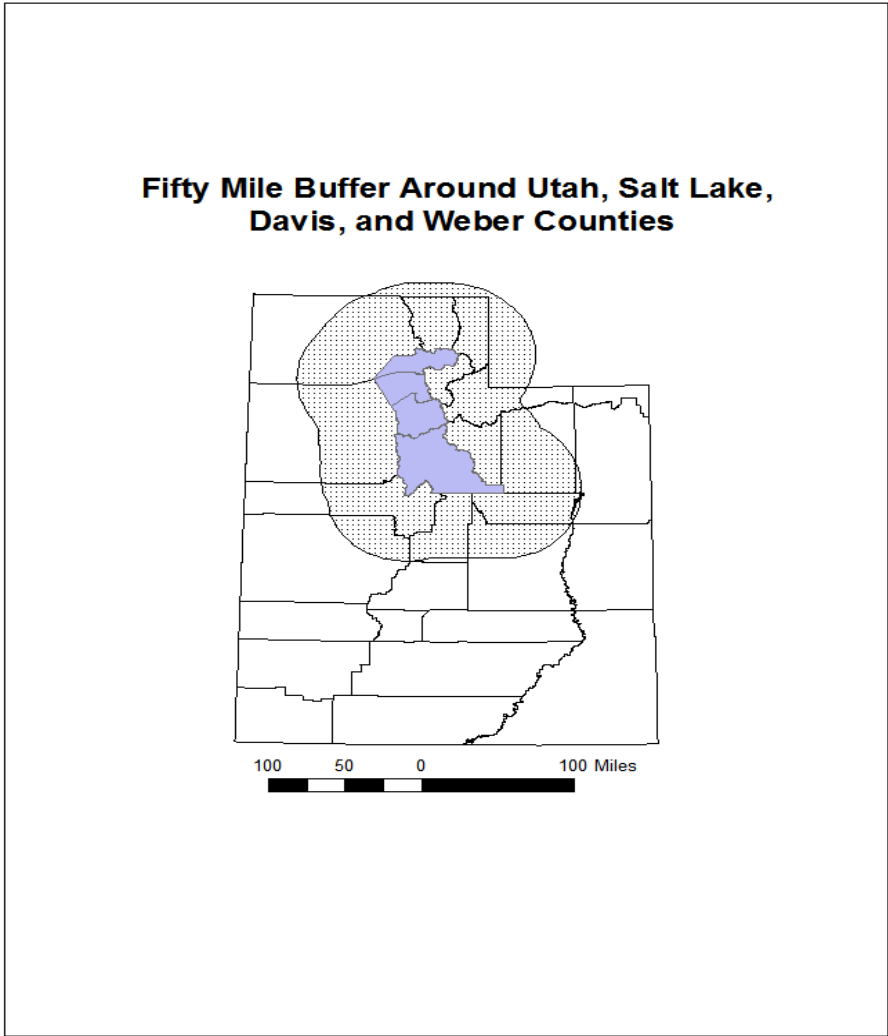
- (a) This Plan makes provisions for small incinerators located more than 50 miles from the boundary of the nearest Standard Metropolitan Statistical Areas (SMSA), and which burn less than 2000 pounds per week of hospital, medical or infectious waste or any combination of them. The SMSA boundaries are specified in OMB Bulletin 93-17 entitled *Revised Statistical Definitions for Metropolitan Areas* dated June 30, 1993, and include Davis County, Salt Lake County, Utah County, and Weber County. See Figure 1 to see if your facility is located in a rural area.

Emission limits for small rural incinerators are specified in Table 1A and Table 1B and additional requirements are summarized in Table 2.

- (b) The emission limits in Table 1A and Table 1B apply to small rural incinerators at all times except during periods of startup, shutdown, or malfunction, provided that no hospital, medical, or infectious waste is charged to the designated facility during startup, shutdown, or malfunction.
- (c) Emission limits and test methods are specified in Table 1A and Table 1B.
- (d) In addition, the opacity of the gases leaving the stack or stacks is limited to 10%.

- (e) Each small rural incinerator shall meet requirements for training and qualification of operators, and for waste management plans, as set forth in Parts D and E of this Plan.

**Figure 1. 50-Mile Radius from Weber, Davis, Salt Lake and Utah Counties.**



**Table 1A.-- Emission Limits for Small HMIWI That Meet the Rural Criteria\* Under 40 CFR 60.33e(b)(1)**

<b>Emission Limits</b>				
<b>Pollutant</b>	<b>Units (7 percent oxygen, dry basis)</b>	<b>HMIWI Emissions Limits</b>	<b>Averaging Time<sup>1</sup></b>	<b>Method of Demonstrating Compliance<sup>2</sup></b>
Particulate Matter	Milligrams per dry standard cubic meter (mg/dscm) (grains per dry standard cubic foot (gr/dscf))	197 (0.086)	3-run average (1-hour minimum sample time per run)	EPA Reference Method 5 of Appendix A-3 of Part 60, or EPA Reference Method 26A or 29 of Appendix A-8 of Part 60.
Carbon Monoxide	Parts per million by volume (ppmv)	40	3-run average (1-hour minimum sample time per run)	EPA Reference Method 10 or 10B of Appendix A-4 of Part 60.
Dioxins/ furans	Nanograms per dry standard cubic meter total dioxins/furans (ng/dscm) (grains per billion dry standard cubic feet (gr/10 <sup>9</sup> dscf)) or ng/dscm TEQ (gr/10 <sup>9</sup> dscf)	800 (350) or 15 (6.6)	3-run average (4-hour minimum sample time per run)	EPA Reference Method 23 of Appendix A-7 of Part 60.
Hydrogen Chloride	Ppmv	3,100	3-run average (1-hour minimum sample time per run)	EPA Reference Method 26 or 26A of Appendix A-8 of Part 60.

Sulfur Dioxide	Ppmv	55	3-run average (1-hour minimum sample time per run)	EPA Reference Method 6 or 6C of Appendix A-4 of Part 60.
Nitrogen Oxides	Ppmv	250	3-run average (1-hour minimum sample time per run)	EPA Reference Method 7 or 7E of Appendix A-4 of Part 60.
Lead	mg/dscm (grains per thousand dry standard cubic feet (gr/10 <sup>3</sup> dscf))	10 (4.4)	3-run average (1-hour minimum sample time per run)	EPA Reference Method 29 of Appendix A-8 of Part 60
Cadmium	mg/dscm (gr/10 <sup>3</sup> dscf)	4 (1.7)	3-run average (1-hour minimum sample time per run)	EPA Reference Method 29 of Appendix A-8 of Part 60
Mercury	mg/dscm (gr/10 <sup>3</sup> dscf)	7.5 (3.3)	3-run average (1-hour minimum sample time per run)	EPA Reference Method 29 of Appendix A-8 of Part 60

Note: Stack opacity shall be determined using EPA Method 9. It shall not exceed 10%.

\* Small incinerators operating at a location 50 miles away from the boundaries of Davis, Salt Lake, Utah, and Weber Counties are subject to the requirements of Table 1A.

<sup>1</sup> Except as allowed under 40 CFR 60.56c(c) for HMIWI equipped with CEMS.

<sup>2</sup> Does not include CEMS and approved alternative non-EPA test methods allowed under 40 CFR 60.56c(b).



**Table 1B.-- Emission Limits for Small Existing HMIWI That Meet the Rural Criteria\* Under 40 CFR 60.33e(b)(2)**

<b>Emission Limits</b>				
<b>Pollutant</b>	<b>Units (7 percent oxygen, dry basis)</b>	<b>HMIWI Emissions Limits</b>	<b>Averaging Time<sup>1</sup></b>	<b>Method of Demonstrating Compliance<sup>2</sup></b>
Particulate Matter	Milligrams per dry standard cubic meter (mg/dscm) (grains per dry standard cubic foot (gr/dscf))	87 (0.038)	3-run average (1-hour minimum sample time per run)	EPA Reference Method 5 of Appendix A-3 of Part 60, or EPA Reference Method 26A or 29 of Appendix A-8 of Part 60.
Carbon Monoxide	Parts per million by volume (ppmv)	20	3-run average (1-hour minimum sample time per run)	EPA Reference Method 10 or 10B of Appendix A-4 of Part 60.
Dioxins/ furans	Nanograms per dry standard cubic meter total dioxins/furans (ng/dscm) (grains per billion dry standard cubic feet (gr/10 <sup>9</sup> dscf)) or ng/dscm TEQ (gr/10 <sup>9</sup> dscf)	240 (100) or 5.1 (2.2)	3-run average (4-hour minimum sample time per run)	EPA Reference Method 23 of Appendix A-7 of Part 60.
Hydrogen Chloride	Ppmv	810	3-run average (1-hour minimum sample time per run)	EPA Reference Method 26 or 26A of Appendix A-8 of Part 60.

Sulfur Dioxide	Ppmv	55	3-run average (1-hour minimum sample time per run)	EPA Reference Method 6 or 6C of Appendix A-4 of Part 60.
Nitrogen Oxides	Ppmv	130	3-run average (1-hour minimum sample time per run)	EPA Reference Method 7 or 7E of Appendix A-4 of Part 60.
Lead	mg/dscm (grains per thousand dry standard cubic feet (gr/10 <sup>3</sup> dscf))	0.5 (0.22)	3-run average (1-hour minimum sample time per run)	EPA Reference Method 29 of Appendix A-8 of Part 60
Cadmium	mg/dscm (gr/10 <sup>3</sup> dscf)	0.11 (0.048)	3-run average (1-hour minimum sample time per run)	EPA Reference Method 29 of Appendix A-8 of Part 60
Mercury	mg/dscm (gr/10 <sup>3</sup> dscf)	0.0051 (0.0022)	3-run average (1-hour minimum sample time per run)	EPA Reference Method 29 of Appendix A-8 of Part 60

Note: Stack opacity shall be determined using EPA Method 9. It shall not exceed 10%.

\* Small incinerators operating at a location 50 miles away from the boundaries of Davis, Salt Lake, Utah, and Weber Counties are subject to the requirements of Table 1A.

<sup>1</sup> Except as allowed under 40 CFR 60.56c(c) for HMIWI equipped with CEMS.

<sup>2</sup> Does not include CEMS and approved alternative non-EPA test methods allowed under 40 CFR 60.56c(b).

**Table 2. Additional Requirements for Existing Small Rural HMIWI**

<b>Additional Requirements</b>	
Operator Training and Qualification Requirements:	Complete HMIWI operator training course. Qualify operators. Maintain information regarding HMIWI operating procedures and review annually.
Inspection Requirements	Provide for an annual equipment inspection of the incinerator.
Waste Management Plan	Prepare a waste management plan that identifies feasibility and approach to separate certain components of a health care waste stream.
Compliance and Performance Testing Requirements	<p>Conduct an initial performance test to determine compliance with the 2009 amended emission limits for all nine pollutants (PM, CO, dioxin/furans, HCL, SO<sub>2</sub>, NO<sub>x</sub>, Pb, Cd, and Hg) and opacity limits for stack and incinerator ash handling operations, and establish operating parameters.*</p> <p>Conduct and demonstrate annual compliance with the amended PM, CO, and HCL emission limits by conducting an annual performance test.</p> <p>For existing operations conduct a Method 22 visible emissions test of the incinerator ash handling operation during the next performance test.</p> <p>For new sources conduct a Method 22 visible emissions test of the incinerator ash handling operation during each compliance test.</p>
Monitoring Requirements	<p>Install and maintain equipment to continuously monitor operating parameters including secondary chamber temperature, waste feed rate, by pass stack, and APCD operating parameters as appropriate.</p> <p>Obtain monitoring data at all times during HMIWI operation.</p>
Reporting and Record keeping Requirements	Maintain for 5 years records of results from the initial performance test and all subsequent performance tests, operating

	<p>parameters, inspections, and maintenance, and operator training and qualification.</p> <p>Submit the results of the initial performance test and all subsequent performance tests.</p> <p>Submit reports on emission rates or operating parameters that have not been recorded or which exceeded applicable limits.</p>
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**2. Inspection and Repair Requirements.**

- (a) Each small rural incinerator subject to the emission limits under 40 CFR 60.33e(b)(1) shall conduct an annual equipment inspection no later than 12 months following the previous annual equipment inspection.
- (b) Each small rural incinerator subject to the emission limits under 40 CFR 60.33e(b)(2) shall conduct an initial air pollution control device (equipment) inspection within one year after EPA approval of this Plan but no later than October 6, 2014. Each small rural incinerator shall undergo an equipment inspection annually no later than 12 months following the previous annual inspection.
- (c) Within ten operating days following an equipment inspection all necessary repairs shall be completed unless the owner or operator obtains written approval from the executive secretary that establishes a date when all necessary repairs of the designated facility shall be completed.
- (d) 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 or replace lining as necessary;

- (viii) Inspect incinerator shell for corrosion and for hot spots;
- (ix) Inspect secondary and 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 and 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 each air pollution control device 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 ensure that the equipment is maintained in good operating condition.

### **3. Compliance and Performance Testing.**

- (a) During performance testing, the requirement that the small rural incinerator burn no more than 2000 pounds per week of hospital, medical and infectious waste or any combination of them does not apply.
- (b) The owner or operator of a small rural incinerator as defined in 40 CFR 60.32e(a)(1) shall conduct annual performance testing no later than 12 months following the previous performance test to determine compliance with the emission limits established in Table 2A using the procedures and test methods described below.
- (c) The owner or operator of a small rural incinerator as defined in 40 CFR 60.32e(a)(2) shall conduct an initial performance testing to determine compliance with the emission limits established in Table 2B using the procedures and test methods described in 3.d of this Plan.
- (d) Test Methods. Test methods are summarized in Appendix B.  
The use of the bypass stack during a performance test shall invalidate the performance test. All test methods specified in this Plan are those listed in 40 CFR 60 Appendix A, and are available from the Division of Air Quality.
- (i) Each performance test shall consist of a minimum of three test runs conducted under representative operating conditions.

- (ii) The minimum sample time shall be one hour per test run unless otherwise indicated.
- (iii) EPA Reference Method 1 shall be used to select the sampling location and number of traverse points.
- (iv) EPA Reference Method 3 or 3A shall be used for gas composition analysis, including measurement of oxygen concentration. EPA Reference Method 3 or 3A shall be used simultaneously with each reference method.
- (v) The concentrations of the pollutants shall be adjusted to 7% oxygen using the following equation:

$$C_{adj} = C_{meas} [20.9 - 7] / [20.9 - \% O_2]$$

where:

$C_{adj}$  = pollutant concentration adjusted to 7% oxygen;  
 $C_{meas}$  = pollutant concentration measured on a dry basis (20.9 - 7) = 20.9% oxygen minus 7 oxygen (defined oxygen correction basis);  
 20.9 = oxygen concentration in air, percent; and  
 $\%O_2$  = oxygen concentration measured on a dry basis, percent.

- (vi) EPA Reference Method 5, Method 26A, or 29 shall be used to measure the particulate matter emissions.
- (vii) EPA Reference Method 9 shall be used to measure stack opacity.
- (viii) EPA Reference Method 10 or 10B shall be used to measure the carbon monoxide emissions.
- (ix) EPA Reference Method 23 shall be used to measure total dioxin and furan emissions. The minimum sample time shall be 4 hours per test run. If instead of measuring total dioxin and furan, the designated facility has selected to compute the toxic equivalency standards for dioxin and furan, the following procedures shall be used to determine compliance:
  - (A) Measure the concentration of each dioxin and furan tetra- through octo-congener emitted using EPA Reference Method 23.
  - (B) For each dioxin and furan congener measured in accordance with (A) above, multiply the congener concentration by its corresponding toxic equivalency factor specified in Table 3 of this Plan.
  - (C) Sum the products calculated in accordance with paragraph (B) above to obtain the total concentration of dioxin/furan emitted in terms of toxic equivalency.
- (x) EPA Reference Method 26 or 26A shall be used to measure hydrogen chloride emissions.

- (xi) EPA Reference Method 6 or 6C shall be used to measure sulfur dioxide emissions.
  - (xii) EPA Reference Method 7 or 7E shall be used to measure nitrogen oxides emissions.
  - (xiii) EPA Reference Method 29 shall be used to measure mercury (Hg), cadmium (Cd), and lead (Pb) emissions.
- (e) Following the date on which the initial performance test is completed or October 6, 2014, whichever date comes first, the owner or operator of an designated facility shall determine compliance with the opacity limit by conducting an annual performance test using the applicable procedures and test methods listed in (d) above. Each annual test shall be conducted no later than 12 months following the previous performance test.
- (f) Each operator shall establish the maximum charge rate and minimum secondary chamber temperature as site-specific operating parameters during the initial performance test to determine compliance with emission limits in Table 2b.
- (g) Following the date on which the initial performance test is completed or October 6, 2014, whichever date comes first, the operator 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 established operating parameters.
- (h) 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 dioxin/furan emission limits. However, the owner or operator of a designated facility may conduct a repeat performance test within 30 days of violation of any applicable operating parameter to demonstrate that the designated facility is not in violation of the applicable emission limits. Each repeat performance test conducted pursuant to this paragraph shall be conducted using the identical operating parameters that indicated a violation.

**Table 3. Toxic Equivalency Factors**

<b>DIOXIN/FURAN CONGENER</b>	<b>TOXIC EQUIVALENCY FACTOR</b>
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

**4. Monitoring.**

- (a) Each small rural incinerator shall install, calibrate, maintain, and operate a device for measuring and recording the temperature of the secondary chamber on a continuous basis. The device shall be calibrated to manufacturer's specifications. The output shall be recorded, at a minimum, once every minute throughout operation.
- (b) The owner or operator 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. The device shall be calibrated to manufacturer's specifications.
- (c) The owner or operator of a designated 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% of the operating hours per day and for 90% of the operating hours per calendar quarter that the designated facility is combusting hospital, medical or infectious waste, or any combination of them.

**5. Reporting and Recordkeeping.**

- (a) Each small rural incinerator shall maintain records of the annual equipment inspections, any required maintenance, and any repairs not completed within ten days of an inspection.



- (b) Each small rural incinerator shall submit the records annually 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.
- (c) Once the unit is required under R307-415 to obtain an operating permit, the owner or operator shall submit these reports semiannually. The report shall be signed by the facilities manager.

**6. Compliance Times.**

Compliance times are specified in Part K of this Plan.

**G. EMISSION REQUIREMENTS FOR LARGE, MEDIUM, AND SMALL NON-RURAL INCINERATORS.**

Special requirements for small incinerators located in rural areas are found in Part F of this Plan.

Emission limits for the following pollutants are specified in Table 4A and Table 4B and other requirements are summarized in Table 5:

particular matter (PM)	oxides of nitrogen, measured as NO <sub>x</sub>
carbon monoxide (CO)	lead (Pb)
dioxins/furans	cadmium (Cd)
hydrochloric acid (HCl)	mercury (Hg)
oxides of sulfur, measured as	
sulfur dioxide (SO <sub>2</sub> )	

In addition, this Plan limits the opacity of the gases leaving the stack or stacks, and, for large incinerators, the opacity of combustion ash.

**1. Incinerator Categories.**

The emission limit for each pollutant is based on its size and operation of the incinerator. There are three categories of incinerator.

- (a) For continuous or intermittent incinerators, the categories are based on the feed rate:
  - Small      burns up to 200 pounds per hour
  - Medium    burns more than 200 pounds per hour but less than 500 pounds per hour
  - Large      burns more than 500 pounds per hour.

The incinerator's capacity may be determined by:

Capacity in lbs/hr =  $v [15000/8500]$ ; where v is the volume of the primary chamber in cubic feet.

**Table 4A--Emission Limits for Small, Medium, and Large HMIWI at Designated Facilities as Defined in 40 CFR 60.32e(a)(1)**

<b>Emission Limits</b>						
<b>HMIWI size</b>						
<b>Pollutant</b>	<b>Units (7 percent oxygen, dry basis)</b>	<b>Small</b>	<b>Medium</b>	<b>Large</b>	<b>Averaging Time<sup>1</sup></b>	<b>Method of Demonstrating Compliance<sup>2</sup></b>
Particulate Matter	Milligrams per dry standard cubic meter (mg/dscm) (grains per dry standard cubic foot (gr/dscf))	115 (0.05)	69 (0.03)	34 (0.015)	3-run average (1-hour minimum sample time per run)	EPA Reference Method 5 of Appendix A-3 of Part 60, or EPA Reference Method 26A or 29 of Appendix A-8 of Part 60.
Carbon Monoxide	Parts per million by volume (ppmv)	40	40	40	3-run average (1-hour minimum sample time per run)	EPA Reference Method 10 or 10B of Appendix A-4 of Part 60.
Dioxins/ furans	Nanograms per dry standard cubic meter total dioxins/furans (ng/dscm) (grains per billion dry standard cubic feet (gr/10 <sup>9</sup> dscf)) or ng/dscm TEQ (gr/10 <sup>9</sup> dscf)	125 (55) or 2.3 (1.0)	125 (55) or 2.3 (1.0)	125 (55) or 2.3 (1.0)	3-run average (4-hour minimum sample time per run)	EPA Reference Method 23 of Appendix A-7 of Part 60.

Hydrogen Chloride	Ppmv or percent reduction	100 or 93%	100 or 93%	100 or 93%	3-run average (1-hour minimum sample time per run)	EPA Reference Method 26 or 26A of Appendix A-8 of Part 60.
Sulfur Dioxide	Ppmv	55	55	55	3-run average (1-hour minimum sample time per run)	EPA Reference Method 6 or 6C of Appendix A-4 of Part 60.
Nitrogen Oxides	Ppmv	250	250	250	3-run average (1-hour minimum sample time per run)	EPA Reference Method 7 or 7E of Appendix A-4 of Part 60.
Lead	mg/dscm (grains per thousand dry standard cubic feet (gr/10 <sup>3</sup> dscf)) or percent reduction	1.2 (0.52) or 70%	1.2 (0.52) or 70%	1.2 (0.52) or 70%	3-run average (1-hour minimum sample time per run)	EPA Reference Method 29 of Appendix A-8 of Part 60
Cadmium	mg/dscm (gr/10 <sup>3</sup> dscf) or percent reduction	0.16 (0.07) or 65%	0.16 (0.07) or 65%	0.16 (0.07) or 65%	3-run average (1-hour minimum sample time per run)	EPA Reference Method 29 of Appendix A-8 of Part 60
Mercury	mg/dscm (gr/10 <sup>3</sup> dscf) or percent reduction	0.55 (0.24) or 85%	0.55 (0.24) or 85%	0.55 (0.24) or 85%	3-run average (1-hour minimum sample time per run)	EPA Reference Method 29 of Appendix A-8 of Part 60

<sup>1</sup> Except as allowed under 40 CFR 60.56c(c) for HMIWI equipped with CEMS.

<sup>2</sup> Does not include CEMS and approved alternative non-EPA test methods allowed under 40 CFR 60.56c(b).

**Table 4B--Emission Limits for Small, Medium, and Large HMIWI at Designated Facilities as Defined in 40 CFR 60.32e(a)(1) and (a)(2)**

<b>Emission Limits</b>						
<b>HMIWI size</b>						
<b>Pollutant</b>	<b>Units (7 percent oxygen, dry basis)</b>	<b>Small</b>	<b>Medium</b>	<b>Large</b>	<b>Averaging Time<sup>1</sup></b>	<b>Method of Demonstrating Compliance<sup>2</sup></b>
Particulate Matter	Milligrams per dry standard cubic meter (mg/dscm) (grains per dry standard cubic foot (gr/dscf))	66 (0.029)	46 (0.020)	25 (0.011)	3-run average (1-hour minimum sample time per run)	EPA Reference Method 5 of Appendix A-3 of Part 60, or EPA Reference Method 26A or 29 of Appendix A-8 of Part 60.
Carbon Monoxide	Parts per million by volume (ppmv)	20	5.5	11	3-run average (1-hour minimum sample time per run)	EPA Reference Method 10 or 10B of Appendix A-4 of Part 60.
Dioxins/ furans	Nanograms per dry standard cubic meter total dioxins/furans (ng/dscm) (grains per billion dry standard cubic feet (gr/10 <sup>9</sup> dscf)) or ng/dscm TEQ (gr/10 <sup>9</sup> dscf)	16 (7.0) or 0.013 (0.0057)	0.85 (0.37) or 0.020 (0.0087)	9.3 (4.1) or 0.054 (0.024)	3-run average (4-hour minimum sample time per run)	EPA Reference Method 23 of Appendix A-7 of Part 60.

Hydrogen Chloride	Ppmv	44	7.7	6.6	3-run average (1-hour minimum sample time per run)	EPA Reference Method 26 or 26A of Appendix A-8 of Part 60.
Sulfur Dioxide	Ppmv	4.2	4.2	9.0	3-run average (1-hour minimum sample time per run)	EPA Reference Method 6 or 6C of Appendix A-4 of Part 60.
Nitrogen Oxides	Ppmv	190	190	140	3-run average (1-hour minimum sample time per run)	EPA Reference Method 7 or 7E of Appendix A-4 of Part 60.
Lead	mg/dscm (grains per thousand dry standard cubic feet (gr/10 <sup>3</sup> dscf))	0.31 (0.14)	0.018 (0.0079)	0.036 (0.016)	3-run average (1-hour minimum sample time per run)	EPA Reference Method 29 of Appendix A-8 of Part 60
Cadmium	mg/dscm (gr/10 <sup>3</sup> dscf)	0.017 (0.0074)	0.013 (0.0057)	0.0092 (0.0040)	3-run average (1-hour minimum sample time per run)	EPA Reference Method 29 of Appendix A-8 of Part 60
Mercury	mg/dscm (gr/10 <sup>3</sup> dscf)	0.014 (0.0061)	0.025 (0.011)	0.018 (0.0079)	3-run average (1-hour minimum sample time per run)	EPA Reference Method 29 of Appendix A-8 of Part 60

<sup>1</sup> Except as allowed under 40 CFR 60.56c(c) for HMIWI equipped with CEMS.

<sup>2</sup> Does not include CEMS and approved alternative non-EPA test methods allowed under 40 CFR 60.56c(b).

**Table 5. Additional Requirements Under the Guidelines for Existing HMIWI**

Additional Requirements	
Operator Training and Qualification Requirements	Complete HMIWI operator training course. Qualify operators. Maintain information regarding HMIWI operating procedures and review annually.
Waste Management Plan	Prepare a waste management plan that identifies feasibility and approach to separate certain components of a health care waste stream.
Compliance and Performance Testing Requirements	<p>Conduct an initial performance test to determine compliance with the 2009 amended emission limits for all nine pollutants (PM, CO, dioxins/furans, HCL, SO<sub>2</sub>, NO<sub>x</sub>, Pb, Cd, and Hg) and opacity limits for stack and incinerator ash handling operations, and establish operating parameters.*</p> <p>Conduct and demonstrate annual compliance with the amended PM, CO, and HCL emission limits by conducting an annual performance test.</p> <p>For existing operations conduct a Method 22 visible emissions test of the incinerator ash handling operation during the next performance test.</p> <p>For new sources conduct a Method 22 visible emissions test of the incinerator ash handling operation during each compliance test.</p>

\* Results of previous emission tests can be used to demonstrate initial compliance with the amended emissions limits as long as the sources certify that the previous test results are representative of current operations with regard to factors such as charge rate, operating parameters, etc. [40 CFR 60.37e(f)] Only those sources who could not so certify and/or whose previous emission tests do not demonstrate compliance with one or more amended emission limits would need to conduct another emission test for those pollutants. [40 CFR 60.37e(a)(2), (b)(2), and (f) and 60.56c(b)]

- (b) For a batch incinerator, the maximum charge rate is used:
- Small     less than or equal to 1600 pounds per day
  - Medium   more than 1600 pounds per hour but less than or equal to 4000 pounds per day
  - Large     more than 4000 pounds per day.

The batch incinerator's capacity may be determined by:

Capacity in lbs/hr =  $v$  [4/hours of batch operation], where  $v$  is the volume of the primary chamber in cubic feet.

- (c) An incinerator may establish a maximum charge rate less than its capacity at the time of initial testing and may then be considered to be in the lesser classification.

## **2. Incinerator's Emission Limits.**

Each incinerator shall comply with the emission limits in Table 4A and Table 4B as well as the required testing methods found in Part H of the Plan for all three categories, except for the small rural incinerators addressed in Part F above.

## **3. Opacity Limits.**

- (a) The opacity of the combustion gas leaving the stack shall not exceed 10%, measured as a six-minute block average. This requirement shall be effective upon the completion of the initial performance test, or the date the test was required to have been completed, whichever is sooner.
- (b) Special Requirements for Large Incinerators. The opacity of visible emissions of combustion ash emitted to the atmosphere from an ash conveying system including conveyor transfer points shall not exceed 5% of the observation period of nine minutes per three-hour period as determined by EPA Reference Method 22. This requirement shall be effective upon the completion of the initial performance test, or October 6, 2014, whichever is sooner.
  - (i) This requirement does not include visible emissions inside buildings or enclosures of ash conveying systems but it does include visible emissions discharged to the atmosphere from buildings or enclosures of ash conveying systems.
  - (ii) This requirement does not apply during maintenance and repair of ash conveying systems. Maintenance or repair shall not exceed ten operating days per calendar quarter unless the owner or operator obtains written approval from the executive secretary establishing a date whereby all necessary maintenance or repair shall be completed.

## **H. COMPLIANCE, PERFORMANCE TESTING AND MONITORING FOR LARGE, MEDIUM, AND SMALL NON-RURAL INCINERATORS.**

Requirements for small rural incinerators are found in Part F of this Plan.

### **1. Summary of Requirements for Large, Medium and Small Incinerators.**

- (a) Establish operating parameters and conduct an initial performance test to determine compliance with the opacity limit and with emission limits for the following pollutants: particulate matter [PM],

carbon monoxide [CO], sulfur dioxide [SO<sub>2</sub>], oxides of nitrogen [NO<sub>x</sub> ], dioxin/furans hydrochloric acid [HCl], lead [Pb], cadmium [Cd], and mercury [Hg].

- (b) Conduct annual performance tests to determine compliance with the PM, CO, and HCl emission limits and opacity limit.
- (c) Facilities may conduct performance tests for PM, CO, and HCl every third year if the previous three HMIWI performance tests have demonstrated that the facility is in compliance with the emission limits for PM, CO, or HCl.

## **2. Compliance and Performance Testing.**

- (a) The emission limits in Part G of the Plan apply at all times except during periods of startup, shutdown, or malfunction, provided that no hospital, medical, or infectious waste is charged to the designated facility during startup, shutdown, or malfunction.
- (b) The owner or operator of an incinerator shall conduct an initial performance test to determine compliance with the emission limits using the procedures and test methods listed in (i) through (xii) below. The use of the bypass stack during a performance test shall invalidate the performance test. All test methods specified in this Plan are those listed in 40 CFR 60 Appendix A, and are available from the Division of Air Quality.
  - (i) Each performance test shall consist of a minimum of three test runs conducted under representative operating conditions.
  - (ii) The minimum sample time shall be one hour per test run unless otherwise indicated.
  - (iii) EPA Reference Method 1 shall be used to select the sampling location and number of traverse points.
  - (iv) EPA Reference Method 3 or 3A shall be used for gas composition analysis, including measurement of oxygen concentration. EPA Reference Method 3 or 3A shall be used simultaneously with each reference method.
  - (v) The concentrations of the pollutants shall be adjusted to 7% oxygen using the following equation:

$$C_{\text{adj}} = C_{\text{meas}} [20.9 - 7] / [20.9 - \% \text{O}_2]$$

where:

$C_{\text{adj}}$  = pollutant concentration adjusted to 7% oxygen;  
 $C_{\text{meas}}$  = pollutant concentration measured on a dry basis (20.9 - 7) = 20.9% oxygen minus 7% oxygen (defined oxygen correction basis);



20.9 = oxygen concentration in air, percent; and %O<sub>2</sub> = oxygen concentration measured on a dry basis, percent.

- (vi) EPA Reference Method 5, 26A or 29 shall be used to measure the particulate matter emissions.
- (vii) EPA Reference Method 9 shall be used to measure stack opacity.
- (viii) EPA Reference Method 10 or 10B shall be used to measure the carbon monoxide emissions.
- (ix) EPA Reference Method 23 shall be used to measure total dioxin and furan emissions. The minimum sample time shall be 4 hours per test run.

If instead of measuring total dioxin and furan, the designated facility has selected to compute the toxic equivalency standards for dioxin and furan, the following procedures shall be used to determine compliance:

- (A) Measure the concentration of each dioxin and furan tetra-through octo-congener emitted using EPA Reference Method 23.
  - (B) For each dioxin and furan congener measured in accordance with (A) above, multiply the congener concentration by its corresponding toxic equivalency factor specified in Table 3 of this Plan.
  - (C) Sum the products calculated in accordance with (B) above to obtain the total concentration of dioxin/furan emitted in terms of toxic equivalency.
- (x) EPA Reference Method 26 or 26A shall be used to measure hydrogen chloride (HCl) emissions. If instead the designated facility has elected to reduce the emission by 93% (see Table 4) -- the percentage of reduction standards for HCl -- the percentage of reduction in HCl emissions shall be computed using the following formula:

$$[\%R_{\text{HCl}}] = \{[E_i - E_o] / [E_i]\} \text{ times } [100]$$

Where:

%R<sub>HCl</sub> = percentage reduction of HCl emissions achieved;

E<sub>i</sub> = HCl emission concentration measured at the control device inlet, corrected to 7% oxygen (dry basis); and

E<sub>o</sub> = HCl emission concentration measured at the control device outlet, corrected to 7% oxygen (dry basis).

- (xi) EPA Reference Method 6 or 6C shall be used to measure the sulfur dioxide (SO<sub>2</sub>) emissions.
- (xii) EPA Reference Method 7 or 7E shall be used to measure the oxides of nitrogen (NO<sub>x</sub>) emissions.

- (xiii) EPA Reference Method 29 shall be used to measure lead (Pb), cadmium (Cd), and mercury (Hg) emissions. If instead the designated facility has elected to reduce the emission of these pollutants by the percentages given in Table 4, the percentage reduction in emissions [%R<sub>metal</sub>] shall be computed using the following formula:

$$[\%R_{\text{metal}}] = \{[E_i - E_o] / [E_i]\} \text{ times } [100]$$

Where:

%R<sub>metal</sub> = percentage reduction of metal emission (Pb, Cd, or Hg) achieved;

E<sub>i</sub> = metal emission concentration (Pb, Cd, or Hg) measured at the control device inlet, corrected to 7 percent oxygen (dry basis); and

E<sub>o</sub> = metal emission concentration (Pb, Cd, or Hg) measured at the control device outlet, corrected to 7 percent oxygen (dry basis).

- (xiv) EPA Reference Method 22 shall be used to determine compliance with the fugitive ash emission limit in Part G.3(b) above. The minimum observation time shall be a series of three one-hour observations.
- (c) The initial compliance test shall be completed no later than one year following approval of the state Plan. An incinerator which has been granted an extension under Part K of this Plan may complete initial compliance testing no later than October 6, 2014. After this date, the owner or operator of a designated facility shall:
- (i) Using EPA Method 9, determine compliance with the opacity limit in Part G.3 by conducting an annual performance test not later than 12 months following the previous performance test.
  - (ii) Determine compliance with the particulate matter (PM), carbon monoxide (CO) and hydrogen chloride (HCl) emission limits by conducting an annual performance test using the applicable procedures and test methods listed in 2(b) above. The test shall be conducted no more than 12 months following the previous performance test.
    - (A) If all three performance tests over a three-year period indicate compliance with the emission limit for each of the three pollutants (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.
    - (B) 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 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.

- (C) 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.
- (iii) The use of the bypass stack during a performance test shall invalidate the performance test.
- (iv) For large HMIWI, determine compliance with the visible emission limits for fugitive emissions from flyash or bottom ash storage and handling by conducting a performance test using EPA Reference Method 22 annually no more than 12 months following the previous performance test.
- (v) A facility using a continuous emission monitoring system (CEMS) to demonstrate compliance with any of the emission limits shall:
  - (A) Determine compliance with each appropriate emission limit using a 12-hour rolling average, calculated each hour as the average of the previous 12 operating hours and not including startup, shutdown, or malfunction.
  - (B) Operate each CEMS in accordance with the applicable requirements of R307-170.
- (d) The owner or operator of a designated facility that is equipped with any of the following combinations of air pollution control devices
  - A dry scrubber + fabric filter,
  - A wet scrubber, or
  - A dry scrubber + fabric filter + a wet scrubber
  - (i) Shall establish the appropriate maximum and minimum operating parameters, indicated in Table 6 of this Plan for each control system, as site specific operating parameters during the initial performance test to determine compliance with the emission limits; and
  - (ii) Shall ensure that the designated facility does not operate above any of the applicable maximum operating parameters or below any of the applicable minimum operating parameters listed in Table 6 of this Plan and measured as three -hour rolling averages at all times except during periods of startup, shutdown and malfunction. The three -hour rolling average shall be calculated each hour as the average of the previous three operating hours. This requirement is effective upon completion of the initial performance test or May 1, 2002, whichever is sooner.
  - (iii) Operating parameter limits do not apply during performance tests. Operation above the established maximum or below any established minimum operating parameter shall constitute a violation of the established operating parameter.
- (e) Except as provided in paragraph (h)(i) below, for designated facilities equipped only with a dry scrubber followed by a fabric filter:

- (i) Operation of the designated facility above the maximum charge rate and below the minimum secondary chamber temperature simultaneously shall constitute a violation of the carbon monoxide emission limit. Charge rate and temperature shall be measured as a three -hour rolling average.
  - (ii) Operation of the designated facility above the maximum fabric filter inlet temperature, above the maximum charge rate, and below the minimum dioxin and furan sorbent flow rate simultaneously shall constitute a violation of the dioxin and furan emission limit. Temperature, charge rate and flow rate shall be measured on a three -hour rolling average.
  - (iii) Operation of the designated facility above the maximum charge rate and below the minimum rate of hydrochloric acid (HCl) sorbent flow rate simultaneously shall constitute a violation of the HCl emission limit.
  - (iv) Operation of the designated facility above the maximum charge rate and below the minimum mercury [Hg] sorbent flow rate simultaneously shall constitute a violation of the mercury emission limit. Charge rate and flow rate shall be measured as a three -hour rolling average.
  - (v) Use of the bypass stack except during startup, shutdown, or malfunction shall constitute a violation of the emission limits for particulate matter, dioxin or furan, hydrochloric acid, lead, cadmium, and mercury.
- (f) Except as provided in (h)(i), for designated facilities equipped only with a wet scrubber:
- (i) Operation of the designated 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 simultaneously shall constitute a violation of the emission limit for particulate matter. Charge rate, pressure drop, horsepower or amperage each shall be measured as a three -hour rolling average.
  - (ii) Operation of the designated facility above the maximum charge rate and below the minimum secondary chamber temperature simultaneously shall constitute a violation of the carbon monoxide emission limit. Charge rate and temperature shall be measured as a three -hour rolling average.
  - (iii) Operation of the designated facility above the maximum charge rate, below the minimum secondary chamber temperature, and below the minimum scrubber liquor flow rate simultaneously shall constitute a violation of the dioxin and furan emission limit. Charge rate, temperature and flow rate shall be measured as a three -hour rolling average.

**Table 6. Operating Parameters to be Monitored and Minimum Measurement and Recording Frequencies**

Operating Parameters to be Monitored	Minimum Frequency			Control System	Dry Scrubber Followed by Fabric Filter and Wet Scrubber
	Data Measurement	Data Recording	Dry Scrubber Followed by Fabric Filter	Wet Scrubber	
<b>Maximum Operating Parameters:</b>					
Maximum Charge Rate	Continuous	1 x hour	√	√	√
Maximum Fabric Filter Inlet Temp.	Continuous	1 x minute	√	No Requirement	√
Maximum Flue Gas Temperature	Continuous	1 x minute	√	√	√
<b>Minimum Operating Parameters:</b>					
Minimum Secondary Chamber Temp.	Continuous	1 x minute	√	√	√
Minimum Dioxin/Furan Sorbent Flow Rate	Hourly	1 x hour	√	No Requirement	√
Minimum HCL Sorbent Flow Rate	Hourly	1 x hour	√	No Requirement	√
Minimum Mercury (Hg) Sorbent Flow Rate	Hourly	1 x hour	√	No Requirement	√
Minimum Pressure Drop Across the Wet Scrubber or Minimum Horsepower or Amperage to Wet Scrubber	Continuous	1 x minute	No Requirement	√	√
Minimum Scrubber Liquor Flow Rate	Continuous	1 x minute	No Requirement	√	√
Minimum Scrubber Liquor pH	Continuous	1 x minute	No Requirement	√	√

- (iv) Operation of the designated facility above the maximum charge rate and below the minimum scrubber liquor pH simultaneously shall constitute a violation of the hydrochloric acid (HCL) emission limit. Charge rate and pH shall be measured as a three -hour rolling average.
  - (v) Operation of the designated facility above the maximum flue gas temperature and above the maximum charge rate simultaneously shall constitute a violation of the mercury [Hg] emission limit. Temperature and charge rate shall be measured as a three -hour rolling average.
  - (vi) Use of the bypass stack except during startup, shutdown, or malfunction shall constitute a violation of the emission limits for particulate matter, dioxin and furan, hydrochloric acid, lead, cadmium, and mercury.
- (g) Except as provided in (h)(i) below, for designated facilities equipped with a dry scrubber followed by a fabric filter and a wet scrubber:
- (i) Operation of the designated facility above the maximum charge rate and below the minimum secondary chamber temperature simultaneously shall constitute a violation of the carbon monoxide emission limit. Charge rate and temperature shall be measured as a three -hour rolling average.
  - (ii) Operation of the designated facility above the maximum fabric filter inlet temperature, above the maximum charge rate, and below the minimum dioxin and furan sorbent flow rate simultaneously shall constitute a violation of the dioxin and furan emission limit. Temperature, charge rate and flow rate shall be measured as a 3-hour rolling average.
  - (iii) Operation of the designated facility above the maximum charge rate and below the minimum scrubber liquor pH simultaneously shall constitute a violation of the hydrochloric acid emission limit. Charge rate and pH shall be measured as a three -hour rolling average.
  - (iv) Operation of the designated 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 mercury emission limit. Charge rate and flow rate shall be measured as a three -hour rolling average.
  - (v) Use of the bypass stack except during startup, shutdown, or malfunction shall constitute a violation of the emission limits for particulate matter, dioxin and furan, hydrochloric acid, lead, cadmium, and mercury.
- (h) Repeat Performance Test.
- (i) The owner or operator of a designated facility may conduct a repeat performance test within 30 days of violation of one or more applicable operating parameters to demonstrate that the designated facility is not in violation of the applicable emission limits. Any repeat performance test conducted pursuant to this paragraph shall be conducted using the identical operating parameters that indicated a violation under paragraphs (e), (f), or (g) above.

(ii) The owner or operator of a designated facility may conduct a repeat performance test at any time to establish new values for the operating parameters.

(iii) The executive secretary may request a repeat performance test at any time.

(i) The owner or operator of an designated facility using an air pollution control device other than those specified in (d) above to comply with the emission limits specified in this Plan shall petition the executive secretary for 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 petition has been approved by the executive secretary.

## **I. MONITORING REQUIREMENTS FOR LARGE, MEDIUM AND SMALL NON-RURAL INCINERATORS.**

### **1. Summary.**

(a) Install and maintain equipment to continuously monitor operating parameters including secondary chamber temperature, waste feed rate, bypass stack, and the operation of air pollution control devices (APCDs) as appropriate.

(b) Obtain monitoring data at all times during incinerator operation.

### **2. Monitoring the Operating Parameters.**

The owner or operator of an designated facility shall install, calibrate to manufacturers' specifications, maintain, and operate devices or establish methods for monitoring the applicable maximum and minimum operating parameters listed in Table 6 of this Plan such that these devices or methods measure and record values for these operating parameters at the frequencies indicated in Table 6 of this Plan at all times except during periods of startup and shutdown.

### **3. Monitoring the Bypass Stack.**

The owner or operator of a designated facility shall install, calibrate to manufacturers' specifications, maintain, and operate a device or method for measuring the use of the bypass stack including date, time, and duration.

### **4. Monitoring Alternative Control Equipment.**

The owner or operator of a designated facility using control devices other than the three combinations specified below to comply with the emission limits in Parts F and G shall install, calibrate to the manufacturers' specifications, maintain, and operate the equipment necessary to monitor the site-specific operating parameters developed pursuant to Part H.2(i) of this Plan.

A dry scrubber followed by a fabric filter

A wet scrubber

A dry scrubber followed by a fabric filter and a wet scrubber

**5. Monitoring Required During Operating Periods.**

The owner or operator of a designated facility shall obtain monitoring data at all times during operation except during periods of monitoring equipment malfunction, calibration, or repair. At a minimum, valid monitoring data shall be obtained for 75% of the operating hours per day and for 90% of the operating days per calendar quarter that the designated facility is combusting hospital, medical, or infectious waste, or any combination of them.

**J. REPORTING AND RECORDKEEPING FOR LARGE, MEDIUM AND SMALL NON-RURAL INCINERATORS.**

**1. Summary:**

- (a) Maintain for five years records of results from initial performance test and all subsequent performance tests, operating parameters, any maintenance, the siting analysis, and operator training and qualification.
- (b) Submit the results of the initial performance test and all subsequent performance tests. Send the data to the executive secretary of the Air Quality Board.
- (c) Submit reports on emission rates or operating parameters that have not been recorded or that exceeded applicable limits to the executive secretary of the Air Quality Board.

**2. Records Identification.**

- (a) The owner or operator of a designated facility shall maintain, as applicable, for a period of at least five years:
  - (i) The calendar date of each record and
  - (ii) Records of the following data:
    - (A) Concentrations of any pollutant listed in Part G above or measurements of opacity as determined by a continuous emissions monitoring system if it is used;
    - (B) HMIWI charge dates, times, and weights and hourly charge rates;
    - (C) Fabric filter inlet temperatures during each minute of operation, as applicable;
    - (D) Amount and type of dioxin or furan sorbent used during each hour of operation, as applicable;
    - (E) Amount and type of mercury (Hg) sorbent used during each hour of operation, as applicable;



- (F) Amount and type of hydrochloric acid (HCl) sorbent used during each hour of operation, as applicable;
  - (G) Secondary chamber temperatures recorded during each minute of operation;
  - (H) Liquor flow rate to the wet scrubber inlet during each minute of operation, as applicable;
  - (I) Horsepower or amperage to the wet scrubber during each minute of operation, as applicable;
  - (J) Pressure drop across the wet scrubber system during each minute of operation, as applicable;
  - (K) Temperature at the outlet from the wet scrubber during each minute of operation, as applicable;
  - (L) pH at the inlet to the wet scrubber during each minute of operation, as applicable;
  - (M) Records indicating use of the bypass stack, including dates, times, and durations, and
  - (N) For facilities complying with Parts H and I above, all operating parameter data collected.
- (iii) A list of calendar days for which data on emission rates or operating parameters specified in (ii) above have not been obtained, including the emission rates or operating parameters not measured, reasons for not obtaining the data, and a description of corrective actions taken.
  - (iv) A list of calendar days, times and durations of malfunctions, a description of the malfunction and the corrective action taken.
  - (v) A list of calendar days for which data on emission rates or operating parameters specified in (ii) above exceeded the applicable limits, with a description of the violations, reasons for such violations, and a description of corrective actions taken.
  - (vi) The results of the initial, annual, and any subsequent performance tests conducted to determine compliance with the emission limits or to establish operating parameters, as applicable.
  - (vii) Records showing the names of incinerator operators who have reviewed of the information in Part D.2(c) of this Plan, including the date of the initial review and each subsequent annual review;
  - (viii) Records showing the names of the operators who have completed the operator training requirements, including training materials sufficient to document compliance with Part D.1 of this Plan, documentation of training and the dates of the training;
  - (ix) Records showing the names of the HMIWI operators who have met the criteria for qualification under Part E of this Plan and the dates of their qualification; and
  - (x) Records of calibration of any monitoring devices required under Part I above.

### **3.Submittal of Records.**

The owner or operator of a designated facility shall submit the following information no later than 60 days following the initial performance test. All reports shall be signed by the facility's manager, and submitted to the executive secretary.

- (a) The initial performance test data, as applicable;
- (b) The values for the site-specific operating parameters, as applicable; and
- (c) The waste management plans.

### **4. Annual Report.**

An annual report shall be submitted 1 year following the submission of the information in paragraph 3 above and subsequent reports shall be submitted no more than 12 months following the previous report. Once the unit is subject to the operating permit requirements under R307-415, the owner or operator of a [n] designated facility shall submit these reports semiannually. The report shall include the information specified in (a) through (h) below. All reports shall be signed by the facility's manager.

- (a) The values for the site-specific operating parameters as established in Part H.2(d) or H.2(i) as applicable.
- (b) The highest maximum operating parameter and the lowest minimum operating parameter, as applicable, for each operating parameter recorded for the calendar year being reported, as established in Part H.2(d) or H.2(i) as applicable.
- (c) The highest maximum operating parameter and the lowest minimum operating parameter, as applicable for each operating parameter recorded pursuant to as established in Part H.2(d) or H.2(i) as applicable for the calendar year preceding the year being reported, in order to provide the executive secretary with a summary of the performance of the designated facility over a two-year period.
- (d) Any information recorded under Part J.2(a)(iii) through J.2( a)(v) above for the calendar year being reported.
- (e) Any information recorded under Part J.2(a)(iii) through J.2( a)(v) of this Plan for the calendar year preceding the year being reported, in order to provide the executive secretary with a summary of the performance of the designated facility over a two-year period.
- (f) If a performance test was conducted during the reporting period, the results of that test.
- (g) If no violations or malfunctions were reported under Part J.2(a)(iii) through J.2( a)(v) for the calendar year being reported, a statement that no violations occurred during the reporting period.
- (h) Any use of the bypass stack, the duration, reason for malfunction, and corrective action taken.

## **5. Semiannual Report.**

The owner or operator of an designated facility shall submit a semiannual report containing any information recorded under Part J.2(a)(iii) through J.2( a)(v) no later than 60 days following the reporting period. The first semiannual reporting period ends six months following the submission of information in Part J.3 of this Plan. Subsequent reports shall be submitted no later than six calendar months following the previous report. All reports shall be signed by the facilities manager.

## **6. Records On-site.**

All records specified under Part J.2 of this Plan shall be maintained onsite in either paper copy or computer-readable format, unless an alternative format is approved by the executive secretary.

## **K. COMPLIANCE TIMES, RETROFITTING AND SHUTDOWNS.**

### **1. Compliance Required Within One Year.**

Each designated facility shall be in compliance with the requirements of this Plan one year after EPA's approval of this Plan, whether or not the incinerator has been identified in this Plan.

- (a) The owner or operator may demonstrate compliance with the present configuration of the incinerator.
- (b) The owner or operator may choose to shut down the incinerator and arrange for the waste to be hauled to another site for incineration or disposal.

### **2. Extension of Compliance Date.**

- (a) If the designated HMIWI cannot be in compliance within 12 months after EPA's approval of this Plan, it shall submit to the executive secretary a petition for extension and a compliance plan showing how the operator shall comply in the shortest possible time period. The extension could be used for one of the following options:
  - (i) to arrange for offsite disposal if that option is not now available;
  - (ii) to arrange for other equipment, such as an autoclave, to replace the incinerator; or
  - (iii) to retrofit the incinerator with pollution control equipment able to demonstrate compliance. The compliance plan accompanying the petition to retrofit shall include the incremental steps and dates found in K.3 of this Plan.
- (b) A petition for extension shall be submitted no later than one year after EPA approval of the State plan. The executive secretary will review the petition and the compliance plan, and will determine whether the extension will be granted.

(c) A petition for extension shall include the following information:

- (i) Documentation of the analyses undertaken to support the need for an extension, including an explanation of why up to three years (but not later than October 6, 2014) after EPA's approval of this Plan is sufficient time to comply with the State plan while one year after EPA's approval of this Plan is not sufficient;
- (ii) An evaluation of the option to transport the waste offsite to a commercial medical waste treatment and disposal facility on a temporary or permanent basis; and
- (iii) Documentation of measurable and incremental steps of progress to be taken towards compliance with the requirements of the Plan.

### **3. Additional Requirements for Retrofitting by a Later Date.**

(a) If the executive secretary approves the petitioner's request for an extension beyond one year after EPA approval of this Plan to retrofit its incinerator, the owner or operator of the incinerator shall comply with the following increments of progress, including the specified dates:

- (i) Submit a statement of intent for retrofitting no later than September 6, 2012
- (ii) Submit details of retrofit plan no later than October 6, 2012
- (iii) Award contracts for air pollution control equipment no later than May 6, 2013
- (iv) Initiate on-site construction no later than [June 2, 1001January 6, 2014
- (v) Complete installation of air pollution control equipment no later than August 6, 2014
- (v) Complete initial compliance test no later than October 6, 2014
- (vii) Be completely in compliance no later than October 6, 2014

(b) All retrofitting activities shall be in compliance within three years after EPA's approval of this Plan, but no later than October 6, 2014.

### **4. HMIWI Shutdown.**

All designated HMIWIs that cannot meet the requirements of the Plan, either by coming into full compliance within 12 months after EPA's approval of this Plan, or by meeting the requirements of K.2 and K.3 of this Plan, shall be shut down within 12 months after EPA's approval of this Plan. A written proof of the shutdown shall be submitted to the executive secretary no later than the date 12 months after EPA's approval of this Plan. It shall include proof of shutdown. The proof shall include evidence of removal of the chamber, or evidence that all the following actions have been completed:

Welding of the waste charge door,  
Removal of the stack, or the bypass,  
Removal of the combustion blower,  
Removal of the burner(s), and  
Removal of the fuel supply.

## **Appendix A Incinerator Inventory Information**

### **Introduction: Method and Meaning**

#### History:

In 1997-1998, as a first step and for the broadest coverage, the Division of Air Quality (DAQ) used the Standard Industrial Classification Codes to find out how many incinerators might be operating in Utah. The DAQ found some 80 possible sources. To these, the DAQ sent a letter informing them of the promulgation of 40 CFR 60 Subpart Ce -- Guidelines for existing HMIWI incinerators --and asked them to confirm if they had been burning hospital, medical, or infectious waste in an incinerator on their facilities. We told them of the states obligation to develop a Plan to effect the requirements of 40 CFR 60, Subpart Ce.

Of the 80 sources, 16 acknowledged burning hospital, medical, or infectious waste in an incinerator on their facilities. To these 16 sources, the DAQ sent a copy of EPA's appendices dealing with emission inventory calculations and the inventory questionnaire. The DAQ included a transmittal letter with appropriate clarifications.

The information the DAQ received from 14 of the 16 sources was quite inadequate. Some sources left many items of the inventory questionnaire blank. Others said none. Two sources had not yet submitted their inventory to the date of the original plan.

We invited these 16 sources to a workshop in Salt Lake City on March 6, 1998 to discuss the requirements of Subpart Ce. The Divisions New Source Review Section conducted the workshop and made engineers available to help the sources to calculate their emissions. Only eight of the 16 sources, braving the severe snow storm on March 6, were able to attend the workshop. When the residence time was unknown, we recommended 1/4 second to be used.

#### State Plan Status to date:

Currently there is only one existing HMIWI incinerator operating in the State of Utah. This facility is currently working with the DAQ in deciding upon a plan of action for demonstrating compliance with the effective requirements of 40 CFR 60, Subpart Ce and this state Plan.

**APPENDIX A**  
**Designated HMIWI Facilities in Utah**

Facility Name: STERICYCLE INCORPORATED - BFI MEDICAL  
WASTE INCINERATOR

Facility Address: 90 North 1100 West  
North Salt Lake, UT 84054

County: Davis

Phone Number: (801) 371-6508

Fax Number: (801) 833-3075

Type of Incinerator: Continuous with Emission Controls & Monitoring

Incinerator Rating: Large

Annual Hours of Operation: 6,240

Annual Waste Burned: 7,183,496 lbs

Gas Residence Time: 2 - seconds

<b>Pollutant</b>	<b>Source Estimated Emissions [tons/year]</b>	<b>Guideline Emission Limits from Part Ce</b>	<b>Source Reported Emissions [tons/year]</b>
Particulate Matter – PM	1.81	0.011 [gr/dscf]	0.12
Carbon Monoxide – CO	2.45	11 [ppmv]	1.33
Dioxin/Furan	0.01324 [lb/yr]	4.1 [gr/10 <sup>9</sup> dscf]	0.0006 [lb]
Hydrogen Chloride – HCL	7.97	6.6 [ppmv]	0.49
Sulfur Dioxide – SO <sub>2</sub>	7.71	9.0 [ppmv]	0.79
Nitrogen Oxide – NO <sub>x</sub>	25.15	140 [ppmv]	24.3
Volatile Organic – VOC Compounds	6.13	-	0.13
Lead – Pb	125.2 [lb/yr]	0.016 gr/10 <sup>3</sup> dscf	0.54 [lb]
Cadmium – Cd	16.86 [lb/yr]	0.0040 gr/10 <sup>3</sup> dscf	0.05 [lb]
Mercury - Hg	57.8 [lb/yr]	0.0079 gr/10 <sup>3</sup> dscf	0.56 [lb]

## **Appendix B Testing Methods**

These EPA Reference Methods are discussed in 40 CFR 60 Appendix A. They are culled from Part H of this State Plan, and listed here for convenience. The left column names the function, or the test to be performed. The middle column lists the EPA-approved Test Methods. The right column gives more information about the test method.

Sample location:	<b>Method 1</b> Selecting the sampling location and number of traverse points.
Stack gas composition:	<b>Method 3 or 3A</b> Analyzing stack gas composition, including measurement of oxygen concentration. Method 3 or 3A shall be used simultaneously with each reference method.
Particulate matter:	<b>Method 5, 26A or 29</b> Measuring the particulate matter emissions.
Stack gas opacity:	<b>Method 9</b> Measure stack opacity.
Carbon monoxide:	<b>Method 10 or 10B</b> Measuring the CO emissions.
Dioxin and Furan:	<b>Method 23</b> Measure total dioxin/furan emissions. The minimum sample time shall be 4 hours per test run. If the designated facility has selected the toxic equivalency standards for dioxin/furan, the following procedures shall be used to determine compliance:  (i) Measure the concentration of each dioxin/furan tetra-through octo-congener emitted using EPA Reference Method 23.  (ii) For each dioxin/furan congener measured in accordance with paragraph (i) above multiply the congener concentration by its corresponding toxic equivalency factor specified in Table 1 of this Sub-part.  (iii) Sum the products calculated in accordance with paragraph (ii) above to obtain the total concentration of dioxin/furan emitted in terms of toxic equivalency.
Hydrochloric acid:	<b>Method 26</b> Measure HCl emissions. If the designated facility has selected the percentage reduction standards for HCl under Sec. 60.52c, the percentage reduction in HCl emissions (%R <sub>HCl</sub> ) is computed using the following formula:

$$[\%R_{\text{HCl}}] = \{[E_i - E_o] / [E_i]\} \text{ times } [100]$$

Where:

$\%R_{\text{HCl}}$  = percentage reduction of HCl emissions achieved;

$E_i$  = HCl emission concentration measured at the control device inlet, corrected to 7 percent oxygen (dry basis); and

$E_o$  = HCl emission concentration measured at the control device outlet, corrected to 7 percent oxygen (dry basis).

Sulfur dioxide:

**Method 6 or 6C** Measuring the SO<sub>2</sub> emissions.

Nitrogen oxides:

**Method 7 or 7E** Measuring the NO<sub>x</sub> emissions.

Lead, cadmium, mercury:

**Method 29** Measuring lead [Pb], cadmium [Cd], and mercury [Hg] emissions. If the designated facility has selected the percentage reduction standards for metals [**under Sec. 60.52c**], the percentage reduction in emissions ( $\%R_{\text{metal}}$ ) is computed using the following formula:

$$[\%R_{\text{metal}}] = \{[E_i - E_o] / [E_i]\} \text{ times } [100]$$

Where:

$\%R_{\text{metal}}$  = percentage reduction of metal emission (Pb, Cd, or Hg) achieved;

$E_i$  = metal emission concentration (Pb, Cd, or Hg) measured at the control device inlet, corrected to 7 percent oxygen (dry basis); and

$E_o$  = metal emission concentration (Pb, Cd, or Hg) measured at the control device outlet, corrected to 7 percent oxygen (dry basis).

Fugitive ash:

**Method 22** Determining compliance with the fugitive emission limit under Sec. 60.52c(c). The minimum observation time shall be a series of three 1-hour observations.



## Appendix C HOW TO ESTIMATE HMIWI EMISSION INVENTORY

The pollutants emitted from hospital, medical, or infectious waste incinerators (HMIWI) include the following:

- metals (cadmium, lead, and mercury),
- particulate matter (PM),
- acid gases (hydrogen chloride, HCl, and sulfur dioxide, SO<sub>2</sub>),
- organic compounds (Dioxins and furans),
- carbon monoxide (CO), and
- nitrogen oxides (NO<sub>x</sub>).

**Important Note:** If you have stack test data, use them to estimate your emissions inventory. If you have data from a continuous emission monitor, use them to estimate your emissions inventory. If you have no emission data, estimate your emissions inventory, using Table C-1 and the equation.

Table C-1 includes emission factors for each of these pollutants. These emission factors were generated based on test data used for development of the amended Emission Guidelines for HMIWI. The test data used to develop the emission factors were thoroughly reviewed for accuracy and reliability prior to use for the amended Emission Guidelines. Therefore, these emission factors are appropriate emission factors for use in developing the updated emission inventory to be submitted in the Utah Division of Air Quality's revised/amended State Plan. The AP-42<sup>1</sup> emission factors may be used as well.

As stated above, use actual data, if data are available. If not, you may estimate emissions inventory by multiplying the amount of waste burned per year at a facility with the emission factor for each pollutant.

For example, to estimate the annual lead [Pb] emissions (lb/yr) for an HMIWI that burns 424,000 lb of hospital, medical, or infectious waste per year and is equipped with a wet scrubber, do the following calculation:

$$(424,000 \text{ lb waste/yr}) \times (3.32\text{E-}06 \text{ lb Pb/lb waste}) = 1.41 \text{ lb Pb/yr}$$

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<sup>1</sup> U.S. Environmental Protection Agency. Compilation of Air Pollutant Emission Factors, 5th ed. (AP-42), Vol. I: Stationary Point and Area Sources, Section 2.3: "Medical Waste Incineration," Research Triangle Park, North Carolina: U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, January 1995.

**TABLE C-1. EMISSION FACTORS FOR HMIWI**

<b>Emission Factors, lb emitted per lb waste charged</b>						
<b>Pollutant</b>	<b>Combustion Control</b>	<b>Wet Scrubbers</b>	<b>Dry Scrubber Without Carbon</b>	<b>Dry Scrubber</b>	<b>Dry/Wet Scrubber</b>	<b>Dry/Wet Scrubber With Carbon</b>
				<b>With Carbon</b>	<b>Without Carbon</b>	
Dioxin/Furan	1.90E-06	2.66E-07	2.45E-07	9.46E-08	3.74E-07	6.84E-08
D/F: TEQ	3.83E-08	4.12E-09	4.19E-09	2.96E-09	7.64E-09	7.78E-10
PM	1.44E-03	6.67E-04	2.28E-04	2.28E-04	5.46E-05	5.46E-05
HCL	4.34E-03	6.79E-05	5.77E-04	5.77E-04	2.96E-04	2.96E-04
Pb	1.41E-05	4.85E-06	6.09E-07	6.09E-07	5.27E-07	5.27E-07
SO2	1.03E-03	2.12E-04	2.84E-04	2.84E-04	1.31E-04	1.31E-04
HG	2.85E-06	1.04E-06	1.92E-06	4.95E-07	9.11E-08	7.81E-08
Cd	2.37E-06	4.16E-07	5.54E-08	5.54E-08	2.44E-08	2.44E-08
CO	w/ 1-sec combustion: 1.09E-04 w/ 2-sec combustion: 7.08E-05 All HMIWI (including unknown retention time): 9.47E-05					
NOx	w/o NOx control: 3.69E-03 w/ NOx control: 1.37E-03					