RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR RESOURCES

111(d) STATE PLAN

FOR

HOSPITAL/MEDICAL/INFECTIOUS WASTE INCINERATORS

PROPOSED
MARCH, 2000

Introduction

On September 15, 1997, in response to the requirements of Sections 111 and 129 of the federal Clean Air Act Amendments of 1990, the Environmental Protection Agency (EPA) promulgated Emission Guidelines (EG) (40 CFR 60 Subpart Ce) and New Source Performance Standards (NSPS) (40 CFR 60 Subpart Ec) for hospital/ medical/ infectious waste incinerators (HMIWI). The EG apply to HMIWI for which construction began on or before June 20, 1996. The NSPS apply to HMIWI for which construction commenced after June 20, 1996. States with incinerators that meet the federal definition of HMIWI are required to adopt State Plans implementing the EG and NSPS for affected facilities. This document, along with proposed Rhode Island Air Pollution Control (RI APC) Regulation No. 39, constitutes Rhode Island's State Plan. RI APC is attached as Appendix A.

The NSPS and EG establish emission limitations for mercury, lead, cadmium, nitrogen oxides, sulfur dioxide, hydrogen chloride, carbon monoxide, dioxins/furans, and particulate matter. They also include operating practices, operator training, monitoring, testing, recordkeeping and reporting requirements, as well as compliance schedules.

The NSPS and EG separate HMIWI into Large, Medium, Small and Small Rural size categories according to the capacity of the facility and its distance from the nearest Standard Metropolitan Statistical Area (SMSA). The Small Rural classification is not relevant in Rhode Island, because the whole state is located within 50 miles of the Providence SMSA.

To identify sources that are subject to and exempt from the HMIWI regulatory requirements, the Rhode Island Department of Environmental Management (RI DEM) sent surveys to all known hospitals, medical centers, funeral homes, crematories, veterinary clinics and animal shelters in the State. RI DEM was able to obtain the necessary information from all 161 surveyed sources, by means of the survey forms and follow-up telephone conversations. A summary of the survey results is attached as Appendix B.

RI DEM identified four HMIWI currently operating in the State of Rhode Island. All are considered large HMIWI according to the federal regulatory scheme. One small incinerator has recently shut down. Table 1 lists the following information for each of the four operating facilities: facility name, number of operating units at the facility, capacity of each unit, and air pollution control equipment currently in place at the facility. Table 2 contains an inventory of air emissions from each of these HMIWI. Since the facilities were all constructed prior to June 20, 1996, they are subject to the requirements of the EG, not the NSPS

The survey also identified 20 pathological waste incinerators operating in Rhode Island. These facilities are exempt from the federal HMIWI requirements, but must adhere to the recordkeeping and notification requirements in Subsection 60.32e of the EG to document

their qualifications for exemption. Table 3 lists the pathological waste incinerators currently operating in Rhode Island and the locations of those facilities.

RI DEM is proposing a new regulation, RI APC Regulation No. 39, as its mechanism for implementation of the requirements of the EG and NSPS. The emission limitations specified in Regulation No. 39 are identical to those in the EG and the NSPS, with the exception of the limit for mercury. The State of Rhode Island is proposing to adopt a more stringent emission limit for mercury than that specified in the EG and NSPS. The proposed Regulation No. 39 mercury emission limit is consistent with the mercury emission limits for HMIWI specified in RI DEM's Mercury Action Plan, (see Appendix C) and in the New England Governors/ Eastern Canadian Premiers Mercury Action Plan. The proposed regulation also includes requirements for testing, monitoring, inspection, reporting, recordkeeping, operator training and qualification that are at least as protective as those in the EG and NSPS.

Tables 4 and 5, respectively, list the Regulation No. 39 emission limits for incinerators for which construction commenced on or before June 20, 1996 and after June 20, 1996. As discussed above, all existing HMIWI in the State were constructed prior to June 20, 1996, so the Table 5 limits will apply only to facilities constructed after the promulgation of this Plan.

When the public participation process is completed, RI DEM will submit this State Plan, including RI APC Regulation No. 39, to the EPA for federal approval. Additionally, the Department will report to the EPA, on an annual basis, the information specified in 40 CFR, Part 60, Appendix D, namely: emissions data and information, progress in Plan enforcement, contingency plan actions and any State Plan revisions.

Regulation History and Purpose

Two sections of the Clean Air Act Amendments of 1990 (CAAA) require EPA to develop regulations limiting emissions of air pollutants from HMIWI. Section 111 of the CAAA requires EPA to develop performance standards and guidelines for any stationary source category that "causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health of welfare." Section 129 of the CAAA directs the EPA to develop standards and guidelines in response to public concerns about emissions from HMIWI and other solid waste combustion units.

EPA addressed these mandates by promulgating NSPS for new HMIWI and EG for existing HMIWI. Section 129 of the CAAA specifies that these standards and guidelines must be based on Maximum Achievable Control Technology (MACT). MACT standards require the maximum achievable emissions reductions, taking into consideration cost and energy requirements.

The EG affect HMIWI for which construction commenced on or before June 20, 1996. Section 129 of the CAAA overrides some aspects of the more general requirements for

control of existing sources in Section 111(d). For instance, Section 111(d) allows states to consider the remaining useful life of the source and other factors when establishing emission limitations, while Section 129 requires State Plans to be at least as protective as the EG.

The NSPS regulate HMIWI for which construction began after June 20, 1996, as mandated in Sections 111(b) and 129 of the CAAA. Section 111(c) allows EPA to delegate enforcement of the NSPS to states. After promulgation of Regulation No. 39, RI DEM intends to request such delegation.

RI DEM is committed to minimizing adverse effects on health, welfare, and the environment associated with air pollution sources in the State, including HMIWI. To that end, certain aspects of Regulation No. 39, as proposed, are more stringent than the federal rules and guidelines. These aspects include a more stringent compliance schedule, more prescriptive specifications concerning the content of the plans that HMIWIs must submit to the Department, and the more stringent mercury emission limitation discussed above. Regulation No. 39, when implemented, will significantly reduce emissions from the HMIWI facilities currently operating in the State.

Demonstration of the State's Legal Authority

Attached as Appendix D is the State Attorney General's finding for Rhode Island's Title V Operating Permit Program. That finding delineates the State's legal authority to carry out the requirements of that program, applicable penalties for sources that do not comply with those requirements, and the State's legal authority to shut down such sources if necessary.

Proposed Regulation No. 39 requires all subject HMIWI to "operate pursuant to a ….Title V operating permit" and requires RI DEM, upon approval of a HMIWI's Emissions Control Plan (ECP), to modify that facility's Title V operating permit to include required elements of the ECP. Therefore, the Attorney General's finding for the Operating Permit program also demonstrates the State's legal authority to enforce the provisions of Sections 111 and 129 of the CAAA for HMIWI, as incorporated in Regulation No. 39.

Identification of Enforceable State Mechanisms

The RI DEM is adopting the requirements in the EG (40 CFR 60 Subpart Ce) and NSPS (40 CFR 60 Subpart Ec) as Rhode Island Air Pollution Control Regulation No.39, et seq., Air Pollution Control Regulations.

Air Quality Impacts

Implementation of Regulation No. 39 is expected to have a significant positive impact on the State's overall environment and air quality. The proposed regulation limits emissions of several criteria pollutants and hazardous air pollutants from HMIWI. The reduction in mercury emissions associated with implementing the regulation will result in reduced ambient air concentrations of that pollutant, and, in turn, in a reduction in the amount of mercury entering waterbodies and contaminating fish. Emissions of dioxins/furans, potent suspected human carcinogens, from HMIWI will also be substantially reduced, as will emissions of nitrogen oxides, which are precursors to the formation of ozone.

Waste Management Plan

Proposed Regulation No. 39 requires all HMIWI facilities to submit a Waste Management Plan to RI DEM's Office of Air Resources within 60 days of the effective date of the regulation. This plan must include measures and milestones toward reaching the goal of being a mercury-free facility by 2003. In addition, since polyvinyl chloride materials (PVC) form dioxins when incinerated, each facility's plan must include milestones towards the goal of reducing PVC in the wastestream by 50% by 2003. Waste Management Plans must also identify waste separation, recycling, and other reasonably available waste management practices, including product substitution, which will be implemented by the facility to minimize the release of air pollutants.

In addition, the Waste Management Plan must state that the HMIWI will require, through a contract or other legal mechanism, that any other facility which transports its hospital/medical/infectious waste to the incinerator adopt and comply with a Waste Management Plan identical to that in place at the HMIWI facility. All aspects of the Waste Management Plan must be in compliance with the RI DEM Office of Waste Management's regulation entitled, "Rules and Regulations Governing the Generation, Transportation, Storage, Treatment, Management and Disposal of Regulated Medical Waste in Rhode Island" (Regulation DEM-DAH-MW-01-92) and other applicable rules and policies of that Office.

Schedule for Compliance

RI DEM has identified four HMIWI currently operating in the State of Rhode Island. All are Large HMIWI constructed prior to June 29, 1996 and are subject to proposed Air Pollution Regulation No. 39. The compliance timeline for these facilities and new facilities that may be built after the promulgation of the Regulation is as follows:

1. Within 60 days of the effective date of the regulation, existing facilities must submit to RI DEM an Emission Control Plan (ECP) containing, at a minimum, the following information:

a. A description and specifications, including control efficiency, of any air pollution control equipment that will be used to comply with the regulation;

b. Standard operating and maintenance procedures for any control equipment that will be used to comply with the regulation; and

c. A proposed schedule for any installation or modification of equipment or modification of processes which will be implemented to comply with the regulation.

2. Except as provided in items #3 and #4 below, existing HMIWI must be in full compliance with all the applicable requirements of RI APC Regulation No. 39 by six months after the effective date of the regulation or must cease operations by that date.

3. If an existing HMIWI cannot comply with all the provisions of the regulation by six months after the effective date of the regulation, the facility may request an extension to the compliance date. This extension request must be included in the ECP, and must include the following information:

   a. Reasons why the facility cannot comply by that date.

   b. The date that contracts will be awarded and/or purchase orders issued for any air pollution control systems and/or material needed for process modifications which will be used to comply with the regulation. All such awards must be issued by six months after the effective date of the regulation.

   c. The date that on-site construction or installation of air pollution control device(s) or process changes used to comply with the regulation will begin. Construction or process changes must be initiated by twelve months following the effective date of the regulation.

   d. The expected date of the completion of on-site construction or installation of control equipment or process changes to comply with the regulation. All equipment installation and process changes must be completed by twenty-four months following the effective date of the regulation.

   e. The date that the initial performance test(s) of any air pollution control device(s) installed to comply with the regulation will be performed. Such tests must be performed by twenty-five months following the effective date of the regulation.

4. If an existing HMIWI decides to comply with the regulation by permanently ceasing operations, it must submit a closure plan to RI DEM by sixty days after the effective date of the regulation and must cease operations within six months. If permanent cessation of operations within six months is not possible, the owner or operator of the HMIWI must apply to RI DEM, as part of its ECP, for an extension to that date, and must enter into an Administrative Consent Order with RI DEM which contains enforceable milestones and commitments towards closure as expeditiously as

possible. In no case shall operations extend beyond one year after the effective date of the regulation.

5. Any HMIWI that commences construction, modification, or reconstruction after June 20, 1996, must comply with the applicable emission limits specified in Regulation No. 39 by the date specified in item #2, above, or immediately upon start-up, whichever date is earlier.

Table 1. HMIWI that have been identified as subject to the Emission Guidelines:

NAME	*LOCATION*	*# OF UNITS*	*UNIT CAPACITY (lbs./hr)*	*CURRENT AIR POLLUTION CONTROL DEVICE*
Eleanor Slater Hospital (Zambarano)	Pascoag, RI	1	1000	None
Our Lady of Fatima	North Providence, RI	1	720	None
RI Hospital	Providence, RI	1	1333	Wet Scrubber
Roger Williams Hospital	Providence, RI	1	750	Dry Scrubber w/o carbon

Table 2. Emissions inventory for HMIWI currently operating in Rhode Island.

FACILITY: Eleanor Slater Hospital (Zambarano)

POLLUTANT	*CALCULATED EMISSIONS (lbs./yr.)*
PM	2,830
Dioxins/Furans	0.00451
Hg	45.7
Pb	47.0
Cd	5.07
HCl	27,700
SO_2	395
CO	188
NOx	1,870

FACILITY: Our Lady of Fatima

POLLUTANT	*CALCULATED EMISSIONS (lbs./yr.)*
PM	3,990
Dioxins/Furans	0.049
Hg	40.3
Pb	41.4
Cd	4.47
HCl	24,400
SO_2	349
CO	3,770
NOx	1,650

FACILITY: Rhode Island Hospital

POLLUTANT	*CALCULATED EMISSIONS (lbs./yr.)*
PM	2,010
Dioxins/Furans	0.000986
Hg	3.03
Pb	7.69
Cd	1.06
HCl	82.0
SO_2	741
CO	352
NOx	3,500

FACILITY: Roger Williams Hospital

POLLUTANT	*CALCULATED EMISSIONS (lbs./yr.)*
PM	4.07
Dioxins/Furans	6.48
Hg	6.57
Pb	0.02
Cd	4.62
HCl	77.6
SO_2	56.8
CO	27.0
NOx	268

Table 3. Pathological waste incinerators presently exempt from sections 111(d) & 129:

NAME	ADDRESS
A&A Cremation Service/ Pocasset Memorial Funeral Home	Tiverton, RI
Anderson-Winfield Funeral Home/ Blue Hills Crematory	Greenville, RI
Animal Care Services	Warwick, RI
Atlantic Cremation Service	Portsmouth, RI
Bayside Cremation Services	E. Greenwich
Brown University Animal Control Facility	Providence, RI
Cremation Society of Rhode Island	Scituate, RI
Cranston Animal Shelter	Cranston, RI
East Bay Crematory	East Providence, RI
Greenville Animal Hospital II LTD	Greenville, RI
Moshassock Cemetery	Central Falls, RI
North Smithfield Animal Pound	North Smithfield, RI
Providence Animal Rescue League	Providence, RI
Providence Dog Pound	Providence, RI
RI SPCA	Riverside, RI
Robert Potter League for Animals	Middletown, RI
Smithfield Dog Pound	Smithfield, RI
Swan Point Cemetery/Crematory	Providence, RI
Warren Animal Hospital	Warren, RI
Westerly Animal Control Facility	Westerly, RI

Table 4. Regulation No. 39 emission limits for HMIWI constructed on or before June 20, 1996

Pollutant	Units (7 percent oxygen, dry basis)	Emission limits		
		HMIWI size		
		Small	Medium	Large
Particulate matter	milligrams per dry standard cubic meter (grains per dry standard cubic foot)	115 (0.05)	69 (0.03)	34 (0.015)
Carbon monoxide	parts per million by volume	40	40	40
Dioxins/furans	either: total dioxins/furans[1] nanograms per dry standard cubic meter (grains per billion dry standard cubic feet), or total dioxin/furan TEQ nanograms per dry standard cubic meter (grains per billion dry standard cubic feet)	125 (55) 2.3 (1.0)	125 (55) 2.3 (1.0)	125 (55) 2.3 (1.0)
Hydrogen chloride	parts per million by volume	100	100	100
Sulfur dioxide	parts per million by volume	55	55	55
Nitrogen oxides	parts per million by volume	250	250	250
Lead	milligrams per dry standard cubic meter (grains per thousand dry standard cubic feet)	1.2 (0.52)	1.2 (0.52)	1.2 (0.52)
Cadmium	milligrams per dry standard cubic meter (grains per thousand dry standard cubic feet)	0.16 (0.07)	0.16 (0.07)	0.16 (0.07)
Mercury	milligrams per dry standard cubic meter (grains per thousand dry standard cubic feet)	0.055 (0.024)	0.055 (0.024)	0.055 (0.024)

[1] Total dioxin/furan is the sum of the emissions of all tetra- through octa-chlorinated dibenzo-p-dioxins and dibenzofurans, as measured by EPA Reference Method 23. To calculate Toxic Equivalent Quantity (TEQ), emissions of those congeners are weighted according to international toxic equivalency factors and then summed.

Table 5. Regulation No. 39 emission limits for HMIWI constructed after June 20, 1996.

Pollutant	Units (7 percent oxygen, dry basis)	Emission limits		
		HMIWI size		
		Small	Medium	Large
Particulate matter	milligrams per dry standard cubic meter (grains per dry standard cubic foot)	69 (0.03)	34 (0.015)	34 (0.015)
Carbon monoxide	parts per million by volume	40	40	40
Dioxins/furans	either: total dioxins/furans[2] nanograms per dry standard cubic meter (grains per billion dry standard cubic feet), or total dioxin/furan TEQ nanograms per dry standard cubic meter (grains per billion dry standard cubic feet)	125 (55) 2.3 (1.0)	25 (11) 0.6 (0.26)	25 (11) 0.6 (0.26)
Hydrogen chloride	parts per million by volume	15	15	15 or
Sulfur dioxide	parts per million by volume	55	55	55
Nitrogen oxides	parts per million by volume	250	250	250
Lead	milligrams per dry standard cubic meter (grains per thousand dry standard cubic feet)	1.2 (0.52)	0.07 (0.03)	0.07 (0.03)
Cadmium	milligrams per dry standard cubic meter (grains per thousand dry standard cubic feet)	0.16 (0.07)	0.04 (0.02)	0.04 (0.02)
Mercury	milligrams per dry standard cubic meter (grains per thousand dry standard cubic feet)	0.055 (0.024)	0.055 (0.024)	0.055 (0.024)

[2] Total dioxin/furan is the sum of the emissions of all tetra- through octa-chlorinated dibenzo-p-dioxins and dibenzofurans, as measured by EPA Reference Method 23. To calculate Toxic Equivalent Quantity (TEQ), emissions of those congeners are weighted according to international toxic equivalency factors and then summed.

Table 6. Estimated National Emission Reductions

The EPA Emissions Guidelines are expected to reduce emissions from existing HMIWI as follows:

Pollutant	Baseline emissions	Nationwide emission reduction	Nationwide emission reduction (percent)[3]
PM, Mg/yr.	940	820 to 870	88% to 92%
CO, Mg/yr.	460	340 to 380	75% to 82%
Total dioxin/ furan[4], g/yr.	7,200	6,900 to 7,000	96% to 97%
dioxin/furan TEQ, g/yr.	148	141 to 143	95% to 97%
HCl, Mg/yr.	5,700	5,600	98%
SO_2, Mg/yr.	250	0 to 74	0% to 30%
NO_x, Mg/yr.	1,200	0 to 350	0% to 30%
Pb, Mg/yr.	11	8.6 to 9.4	80% to 87%
Cd, Mg/yr.	1.2	0.91 to 1.0	75% to 84%
Hg, Mg/yr.	14.5	13.5 to 13.8	93% to 95%[5]

[3] Reductions from the regulatory baseline. Percent reductions were calculated based on the actual (unrounded) values for baseline emissions and nationwide emissions reductions.

[4] Total dioxin/furan is the sum of the emissions of all tetra- through octa-chlorinated dibenzo-p-dioxins and dibenzofurans, as measured by EPA Reference Method 23. To calculate Toxic Equivalent Quantity (TEQ), emissions of those congeners are weighted according to international toxic equivalency factors and then summed.

[5] The State limitation for mercury will be much lower than the federal; therefore the estimated percent reduction in the State should be greater than the 93% to 95% estimated nationally.