HEALTH CARE WITHOUT HARM

Model
State Regulations
for
Medical Waste
Incinerators

ANA
AMERICAN NURSES ASSOCIATION
Nationally, medical waste incinerators (MWIs) are the second leading source of dioxin and the fourth leading source of mercury, according to the U.S. Environmental Protection Agency (EPA). Dioxin is a known human carcinogen which has been linked to reproductive and developmental disorders, and immune system damage. Mercury is a neurotoxin which interferes with the brain development of fetuses and infants. State plans now being developed to implement new federal rules for MWIs offer an opportunity prevent this toxic pollution.

In 1990, Congress passed amendments to the Clean Air Act which included a requirement that the EPA enact standards and guidelines for all new and existing MWIs by 1992. After missing this deadline, the EPA was sued by environmental organizations and a new deadline of July 1997 was established.

On September 15, 1997, the EPA published its final standards and guidelines. The rules establish limits on the emissions of a number of pollutants: dioxins and furans; lead (Pb); cadmium (Cd); mercury (Hg); particulate matter (PM); opacity; sulfur dioxide (SO2); hydrogen chloride (HCl); nitrogen oxides (NOx); carbon monoxide (CO), and fugitive ash emissions. In addition, the rules establish requirements for the training of MWI operators, waste management plans, and testing and monitoring of pollutants and operating parameters. The guidelines also contain equipment inspection requirements for existing MWIs and siting requirements for new MWIs.

The rule-making process does not conclude, however, with the issuance of the EPA's standards and guidelines. Each state is responsible for developing its own plan for how it will implement the new rules. These plans must describe the legal mechanisms the state will use to enforce the rules. Every state must make available to the public their draft implementation plan and provide opportunity for comment at a hearing prior to submitting the plan to the EPA.

Significantly, states are allowed to establish more stringent emissions limits and other requirements than those put forward by the EPA. That is, the EPA's standards and guidelines are a floor — not a ceiling — on the requirements for preventing waste and pollution from MWIs. Unless otherwise prohibited by state law, a state's plan can be more protective of public health and the environment than the EPA's minimum standards. This is an important opportunity. As detailed below, Health Care Without Harm believes that the EPA's standards and guidelines should be strengthened. Health Care Without Harm maintains that more stringent emissions standards are feasible, and that these standards can be attained through reducing the volume and toxicity of the hospital waste stream, in addition to requiring more pollution control equipment. At the same time, it must be emphasized that promulgating strong regulations is not the "be all and end all" — effective enforcement of the standards and implementation of pollution prevention activities is essential to ensure that the regulations are meaningful.

1. Emission Limits

The Clean Air Act required the EPA to develop Maximum Achievable Control Technology (MACT) standards for new and existing MWIs. The law furthermore specifies the method for determining the MACT standards. The EPA is required to analyze available stack testing data on the pollutants of concern from MWIs across the country. The EPA is then required to select the top performing 12 percent of facilities (in terms of least emissions) and calculate an average emissions limit for the different pollutants. These averages would then be the emission limits for existing MWIs. Using the same database of actual stack testing data, the EPA was required to select the best (lowest) emissions limit achieved for each of the pollutants and establish these as the minimum standards for new MWIs. Unfortunately, the EPA did not follow this procedure in calculating its MACT standards, prompting a lawsuit by the Natural Resources Defense Council (NRDC) and the Sierra Club. The EPA furthermore chose to establish different emissions limits for four classes of existing MWIs — "small" (burning 200 pounds or less an hour); "small rural" (located more than 50 miles from the nearest metropolitan area and burning less than 2,000 pounds per week); "medium" (burning more than 200 pounds an hour, but less than 500 pounds an hour), and "large" (burning more than 500 pounds an hour).

Health Care Without Harm maintains that the "true" MACT standards — the standards provided for using the methodology in the Clean Air Act — should be the basis for the state plans and that there should be no distinction between the amount of pollution allowed by small, medium, or large MWIs, rural, suburban, or urban. The true MACT standards are far more protective of public health and the environment. They are also realistic because they reflect the actual performance of well con-
trolled and operated MWIs. Subcategorization of MWIs unnecessarily results in higher emissions by encouraging incineration at smaller and dirtier MWIs. Listed below are the true MACT standards for new and existing MWIs, as calculated by NRDC, and EPA's emissions limits for existing large MWIs.

Comparison of EPA's Standards with the Statutory Minimum Standards as Calculated by NRDC

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>EPA's Ts</th>
<th>NRDC's Ts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Particulate Matter</td>
<td>10.6 g/dscfm</td>
<td>0.6 g/dscfm</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>40 ppmv</td>
<td>0 ppmv</td>
</tr>
<tr>
<td>Dioxine Fluoride</td>
<td>0.8 mg/dscfm TEO</td>
<td>0.076 mg/dscfm TEO</td>
</tr>
<tr>
<td>Hydrochloric Acid</td>
<td>16 ppmv</td>
<td>1 ppmv</td>
</tr>
<tr>
<td>Sulfur Dioxide</td>
<td>50 ppmv</td>
<td>1 ppmv</td>
</tr>
<tr>
<td>Nitrogen Dioxide</td>
<td>250 ppmv</td>
<td>2 ppmv</td>
</tr>
<tr>
<td>Lead</td>
<td>0.07 mg/dscm</td>
<td>0 ppmv</td>
</tr>
<tr>
<td>Cadmium</td>
<td>0.04 mg/dscm</td>
<td>0.004 mg/dscm</td>
</tr>
<tr>
<td>Mercury</td>
<td>0.16 mg/dscm</td>
<td>0.03 mg/dscm</td>
</tr>
</tbody>
</table>

In addition to the pollutants listed above, emission limits should be developed for arsenic, chromium (total and hexavalent), nickel, and PCBs. This is particularly important for PCBs, as MWIs are responsible for 25 percent of the emissions of PCBs, according to the EPA. Testing for these compounds are already required in some current medical waste incinerator permits.

2. Alternative Approaches to Meeting Emissions Limits

It is important not to assume that more stringent standards necessarily require additional, or more sophisticated air pollution control equipment. Some of these standards can be achieved by removing from the waste stream materials which result in emissions of dioxin, mercury, and other pollutants. This “front-door approach” to reducing the volume and toxicity of the hospital waste stream can be a cost-effective means for hospitals to meet more stringent standards.

Considerable research demonstrates a connection between the amount of chlorinated waste entering an incinerator and how much dioxin it emits. In hospitals, the major source of chlorinated waste is polyvinyl chloride (PVC) plastic. Non-PVC alternatives are available for many products made from PVC such as I.V. bags and patient I.E. bracelets, and more are being developed, such as for blood bags. More protective dioxin limits could encourage hospitals to purchase these alternatives and stimulate development of others.

The same concept applies to mercury. Commenting on the EPA's proposed limits for mercury, the New Jersey Department of Environmental Protection wrote “NJDEP believes this is a need for simple mercury waste segregation.” In New Jersey, emissions from medical waste incinerators where facilities are segregating mercury range from 1.8 to 88 ug/dscm — significantly below the EPA's new standard of 550 ug/dscm. Commercial MWIs can also be prompted by stringent standard to encourage hospitals to practice waste segregation and to hold accountable hospitals which do not. For example, when a commercial MWI in Michigan was found to be violating its mercury emission limit, the facility was motivated to encourage mercury pollution prevention and better segregation among its customers to meet its stringent limit.

3. Extended Application of the Standards

As discussed above, the EPA established lower emission limits for "small rural" MWIs. The limits established for these facilities can be met without installing new pollution control devices, but by solely using “go combustion practices.” Despite their size, small MWIs are a significant source of dioxin emissions because of the frequent startup and shutdown, lack of pollution control...
devices, and poor combustion control. Without sufficient oversight, it is doubtful that "good combustion practices" will be employed, and these facilities will continue to emit dangerous levels of pollution. The EPA's argument for imposing relatively more stringent standards on non-rural small facilities is that these facilities will likely shut down because alternative treatment facilities will be available. The EPA's argument for not imposing strong standards on rural facilities is that these facilities will likely remain open because alternatives are not available. Contrary to this logic, however, the fact that rural MWIs are likely to remain open is a compelling reason to take all steps possible to ensure that they are clean. The rural exemption should be removed in the state plans. States may want to assist rural facilities in identifying alternative treatment options.

The EPA also chose to exempt from the new rules incinerators and crematoria if or when they burn only pathological waste (human or animal body parts), expired pharmaceuticals, or radioactive medical waste. This exemption is unwise. Pathological incinerators can be major sources of mercury (from dental amalgams). Many pharmaceuticals may contain chlorine. Finally, emitting radionuclides is a dangerous practice. It should also be noted that facilities may be throwing into their incinerator waste which they are not permitted to burn. Application of the standards could discourage this practice.

4. Initial and Annual Testing

The Clean Air Act requires that sources demonstrate continuous compliance with emissions standards. To ensure that this requirement is fully complied with, states should: 1) require annual stack testing for more of the regulated pollutants; 2) prohibit the "averaging" of test runs — a single failure within a test run should constitute failing the test. EPA requires only an initial stack test for all of the pollutants. Thereafter, EPA requires that for the following three years, just carbon monoxide, particulates, hydrochloric acid, and opacity be tested. If these tests show the facility to be in compliance, then subsequent testing is required only every third year. For small, rural MWIs, the requirements are even less stringent: initial stack testing only for particulates, carbon monoxide, dioxin, mercury, and opacity, with annual stack tests required only for opacity.

All MWIs should be required to conduct annual stack tests for particulates, carbon monoxide, hydrochloric acid, dioxin/furan, lead, cadmium, mercury, and opacity. To better ensure the accuracy of the dioxin testing, the California Air Resources Board's Method 23 should be required: that requires three test runs of four hours each, with a minimum of six cubic meters of stack gas collected. It is essential, furthermore, that the MWI be tested at times when fully representative waste streams are being burned. The results of such testing should be required to be published by each MWI in the newspaper of record for the community which hosts the MWI as well as the newspapers in communities where hospitals which send their waste to the MWI are located.

Increased testing is justified by the fact that combustion conditions in MWIs change considerably with age and as they are degraded by hydrochloric acid emissions. These changes can affect emissions. Annual testing is needed to ensure compliance with emissions limits.

5. Continuous Emissions Monitoring

Continuous emission monitors (CEMs) should be required for carbon monoxide, hydrochloric acid, sulfur dioxide, nitrogen oxide, and oxygen — the latter being essential to determine the efficiency of the burner. If and when it is feasible to conduct such monitoring for mercury, dioxin, and particulates, this should be mandatory. There are some reports that mercury CEMS are now available. Quarterly reporting of such tests to the state regulatory agency should be required with summaries of any exceedences.

The EPA does not require any CEM, requiring instead that operating parameters be measured to ensure compliance. The EPA argues that the cost of CEM is very high — $95,000 alone for hydrochloric acid and carbon monoxide monitor for a large MWI. However, there are other factors — such as waste composition — which effect emissions. The EPA's focus on cost ignores the need to ensure compliance. MWI operators cannot meet their obligation to know their emissions and compliance status — and promptly report deviations — if they do not know what their emissions are. The proposed parameter monitoring cannot achieve this goal.

6. Operator Training and Certification

The EPA requires that a trained operator be on duty or on-call. Given the complexity of operating an MWI and the emissions which could result from only a momentary upset, this requirement should be strengthened to require a trained operator on duty at all times.

Furthermore, the training protocol should require a certain number of hours be spent on waste prevention, including mercury segregation and recycling. Operators of commercial MWIs should also be required to hold waste prevention training for their clients. Finally, initial and annual blood testing of workers involved in waste handling should be required. Testing results of dioxins, furans, heavy metals, radioactive elements, and other toxins of concern should be made available to workers and to the state health department.
7. Waste Management Plans

The EPA requires all operators of MWIs to prepare waste management plans. The requirements for what such plans contain are not specific enough, however. Moreover, implementation of the plans should be mandatory. There are different planning requirements for hospitals which operate their own MWIs and operators of commercial facilities.

Operators of onsite MWIs should be required to develop plans which contain detailed strategies for reducing the volume and toxicity of the waste stream. These should include, but not be limited to:

- phasing out the purchase of mercury;
- phasing out the purchase of PVC products and packaging;
- purchasing products made from recycled materials;
- purchasing reusable products; and,
- collecting recyclable materials.

The plans should also include:

- clear goals;
- a timeline for implementation;
- a description of the staff or committee responsible for implementing the plan;
- a description of how assessments will be conducted to monitor implementation of the plans and progress towards the goals.

Each plan should be updated every two years. A progress report on implementation of the plans and progress toward achieving the goals should be submitted to the state annually.

Operators of commercial MWIs should be required to develop an educational and outreach program to encourage their customers to reduce the volume and toxicity of their waste streams. This program should include, but not be limited to:

- an initial and annual onsite visit, disseminating information packets, and holding regular seminars.

Components of the educational program should include the waste prevention strategies outlined for hospitals above. A similar requirement has been instituted for a commercial autoclave in Vermont, to ensure that mercury in the waste stream is reduced.

Such programs can be extremely cost-effective for hospitals. For example, the Beth Israel Medical Center in New York saves $600,000 per year from its waste prevention program. The hospital reduced its red bag waste by one million pounds, while not experiencing an increase in unregulated waste, due to an extensive recycling program. The hospital is also working toward becoming a mercury-free facility.

8. Inspections

The EPA requires that annual inspections be conducted for only small, rural MWIs. Annual independent inspections should be required for all MWIs, with the results published in local news media.

9. Siting Requirements

Siting of new MWIs should comply with President Clinton’s two Executive Orders on environmental justice and on children’s health. In addition, in determining whether to permit any new MWIs, an analysis must be conducted which details the individual facility’s impacts in the context of existing pollution and public health burdens in the community. The analysis must include a description of vulnerable populations and take into account all exposure routes, such as dermal, ingestion, and inhalation. The analysis must also include a study of the environmental and economic costs and benefits of alternatives to constructing the new MWI (detailed below).

There is increasing evidence that incinerators pose a threat to both nearby residents and to the food supply. A 1996 study published in the British Journal of Cancer found that people who live within 4.6 miles of a municipal solid waste incinerator have an increased likelihood of getting several different cancers. In France, this year, three solid waste incinerators were closed because milk from cows on nearby farms was contaminated with high levels of dioxins.

10. Alternative Analysis Plan

Existing and proposed new incinerators should be required to conduct an “alternative analysis.” This analysis should identify alternatives to incineration, and describe the costs and environmental benefits of these alternatives and incineration. This analysis must be circulated for 45 days for public review, with extensions extended as requested for good cause. All comments shall be responded to in a substantive, legitimate, and understandable manner which clearly states and outlines the areas of disagreement or dissension. After the public's comments have been responded to in writing, a public hearing will be held where members of the public can express their views to the local permitting agency and ask questions about the analysis.

11. MWI Ash

The addition of more air pollution control equipment to MWIs will inevitably result in more toxins, including dioxin and mercury, in the remaining ash. Fly ash from scrubbers is particularly high in toxins. All ash residue from MWIs should be disposed of in an ash monofill. No “recycling” or “beneficial uses” of ash residues (i.e., use in construction materials, road material, or fertilizer) should be allowed.