



Department of Environmental Protection

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Regulation of Municipal Waste Combustors

There are seven waste-to-energy facilities (municipal waste combustors) in Massachusetts. Together, they burn more than one-third of the solid waste generated in our state. These facilities are subject to a variety of environmental and public health requirements at the local, state and federal levels:

- Before a facility that burns more than 1 ton of solid waste per hour may be built in any Massachusetts town or city, the proponent must obtain a site assignment from the local board of health. The site assignment is an official determination that such an operation is a suitable use of the specific property for which it has been proposed. A site assignment is also required for any landfill that accepts residual ash from a municipal waste combustor. The board of health considers a number of factors, including a "site suitability determination" prepared by the Massachusetts Department of Environmental Protection (MassDEP), before issuing a site assignment.
- State law requires review under the Massachusetts Environmental Policy Act (MEPA) before MassDEP may issue any permits for construction of a major facility, such as a municipal waste combustor. MEPA review is an effort by state government to investigate alternatives, minimize environmental damage and secure enforceable commitments to mitigate environmental impacts. It does not pass judgment on whether the required state permits should be issued. The MEPA process encourages public comment from everyone who might be affected by or benefit from the project.
- MassDEP reviews applications for state environmental permits only after the local health board issues a site assignment and the MEPA Unit completes its own review. The agency issues separate permits for construction and operation of a combustion facility, issues approvals for its pollution control technologies and issues permits for its wastewater discharges in conjunction with local and/or federal authorities as appropriate. MassDEP also regulates the construction, operation and closure of landfills that accept ash residuals from combustion facilities.
- The federal government, through the U.S. Environmental Protection Agency (EPA), sets minimum standards that Massachusetts and other states must use to regulate facilities' air emissions and surface water discharges. EPA also reviews state air regulations to ensure they are at least as stringent as federal rules

State & Federal Emissions Standards

Under the federal Clean Air Act, the U.S. Environmental Protection Agency (EPA) is responsible for setting and enforcing standards to limit pollution in the air and prevent significant risks to public health and the environment. The [Massachusetts Clean Air Act](#) (M.G.L. Chapter 111, Sections 142A through 142MO), meanwhile, empowers MassDEP to adopt regulations intended to prevent pollution and contamination of the atmosphere.

In 1995, EPA adopted new emissions rules for the nation's larger municipal waste combustors - those handling more than 250 tons of waste per day. Aimed at reducing toxic and smog-causing emissions, these rules apply to the five largest facilities in Massachusetts but do not cover two smaller facilities in the state. EPA required states to adopt rules at least as stringent as its 1995 regulations and to submit them for federal approval.

In 1998, MassDEP adopted its own Municipal Waste Combustor Rule, including a mercury emissions standard nearly three times more stringent than EPA's. MassDEP did this in part to meet federal Clean Air Act requirements, but also because combustion facilities were a leading source of mercury emissions in the state. EPA approved the MassDEP rule in November 2002.

MassDEP's 1998 Rule required the five largest facilities in Massachusetts to submit [Emission Control Plans](#) (ECPs) for complying with the new standards. These plans, which were subject to public comment and MassDEP approval, included:

- Facility-specific emissions limits and operating parameters.
- Estimates of reductions in mercury emissions with controls in place.
- Emissions monitoring requirements and protocols.
- Periodic reporting requirements and protocols.
- Requirements for reporting "excess emissions" events.

To help facilities meet the strict mercury emissions limit, MassDEP also required their operators to develop and implement [Material Separation Plans](#) for collecting and recycling items that contain mercury before combustion.

By December 2000, all five facilities had completed installing new pollution control technology to comply with MassDEP's 1998 Rule and their own Emission Control Plans.

Initial compliance reports indicated that the five facilities' combined mercury emissions had been reduced by approximately 85 percent from pre-1998 levels. Mercury emissions from the entire MWC sector (including the two smaller facilities in Western Massachusetts) were cut by more than 90 percent overall between 1996 and 2002. This reduction was primarily attributable to pollution control retrofits at the five largest facilities operating at that time, and the closure of two other facilities, in Lawrence and Fall River, before retrofit deadlines.

All seven facilities in Massachusetts hold multiple MassDEP permits pertaining to different regulated activities. Some of these require facilities to meet stricter emissions limits for specific pollutants than the limits established by the 1998 Rule. In these cases, facilities must comply with the most stringent of the requirements.

How the Standards Apply

Of the seven municipal waste combustors currently operating in Massachusetts, five - those located in Haverhill, Millbury, North Andover, Rochester and Saugus - are large facilities that are subject to the MassDEP 1998 Municipal Waste Combustor Rule. Individually, these facilities are permitted to handle between 1,500 tons and 3,000 tons of waste per day. Together, they account for nearly 95 percent of all solid waste combustion in the state.

The remaining facilities, in Agawam and Pittsfield, are comparatively small, each handling less than 250 tons of waste per unit per day, and not subject to the 1998 Rule. Under enforcement settlements with MassDEP, however, the operator of these facilities has agreed to comply with Municipal Waste Combustor Rule emission standards.

In 2000, the U.S. Environmental Protection Agency (EPA) adopted emission rules for smaller municipal waste combustors that also apply to the Agawam and Pittsfield facilities.

How Emissions Are Monitored

All municipal waste combustors in Massachusetts use monitors that record air emissions data at frequent intervals around the clock. These continuous monitoring systems record actual levels of nitrogen oxides (NO_x), sulfur dioxide (SO₂) and carbon monoxide (CO). They also track operating conditions, such as flue gas temperature, that can affect emission levels. Facilities periodically report to MassDEP on excess emissions and monitoring downtime.

Operating conditions fluctuate over time, so it is normal for recorded emission levels to vary. Municipal waste combustors in Massachusetts typically operate within the limits established by their MassDEP permits. On occasion, however, emissions exceed these specified limits. To learn more, see: [Municipal Waste Combustor Emissions Reports](#)

For some pollutants, the only reliable monitoring method currently available is a stack test. This is a specific measurement of emissions gases that facilities are required to perform on a periodic basis: quarterly for mercury and once every nine months for other pollutants. A facility with dioxin and/or mercury emissions consistently below standards over an extended period of time is allowed to perform stack tests for those pollutants less frequently.

A stack test provides a "snapshot" of a facility's emissions at the time testing is performed. Sampling and recording devices are used to simultaneously measure a range of pollutants and operating conditions in several "runs" over the course of a testing day. A laboratory analyzes the samples to determine concentrations of specific pollutants, including mercury, lead, cadmium, particulate matter, hydrogen chloride, and dioxin and furans. The results are then averaged using EPA methodology and emissions data are reported to MassDEP.

Because stack tests do not provide continuous data, fluctuations in emissions that occur between tests are not recorded. Stack tests also do not reliably indicate the actual duration of excess emissions events. If a facility generally operates within the conditions recorded during stack tests, however, it is likely that emission rates will be similar to those measured during testing.

Because the contents of trash entering facilities vary considerably over time, levels of targeted air pollutants as measured by continuous monitoring systems and stack tests likewise vary. When monitoring indicates that an emissions standard has been exceeded, the facility operator is required to report the finding to MassDEP, explain the factors that contributed to excess emissions and outline the steps taken to address them.

The 1998 Rule allows emissions to exceed standards for up to three hours in specific circumstances: when a facility is starting up or shutting down, and when certain types of malfunctions occur. These "excess emissions" must be noted in facilities' annual and semi-annual reports to MassDEP.

Effects on Local Air Quality

In addition to meeting the emission standards established by the 1998 Rule, municipal waste combustors are required by [M.G.L. Chapter 21H, Section 5](#), to test their stack emissions for specific pollutants and to analyze

their effects on air quality in their vicinity. To do this, they hire private testing companies to conduct stack tests every nine months (in conjunction with the stack tests required by the 1998 Rule) and perform computer modeling to estimate the levels of dioxins, furans and several specific heavy metals being emitted

Stack tests are performed using EPA-approved methods, according to plans approved by MassDEP. Stack test results are used with computer models (which have also been approved by EPA) to predict how each facility's emissions will be dispersed from its stacks. The models use assumptions about local weather conditions, air flow and other factors to predict the highest daily and annual average levels of each pollutant in the ambient air. These estimated ambient levels are then compared with MassDEP's 24-hour and annual guidelines for toxic chemicals in ambient air, to determine whether a facility's emissions are resulting in a significant risk of harm to public health and the environment in the vicinity.

Facilities submit stack test and modeling results to MassDEP, which conducts independent reviews to verify the accuracy of those studies. If a facility's emissions are found to exceed MassDEP's 24-hour or annual ambient guidelines, that facility is required to take steps to reduce its emissions and correct the exceedance(s).

Material Separation Plans

Required by MassDEP under the 1998 Rule, these are plans that describe how municipal waste combustor operators will prevent discarded items that contain mercury from entering their facilities.

Material Separation Plans (MSPs) must be submitted to MassDEP at intervals the agency designates. Each facility develops its own plan in consultation with its commercial, industrial and municipal customers. Draft plans are submitted to MassDEP for review. The agency solicits public comment on these documents before approving them, with additional conditions attached, if necessary. Facilities then must implement their Material Separation Plans and submit annual progress reports to MassDEP.

For additional information about MSPs, see the individual facility profiles at: [Municipal Waste Combustors](#)