

## Municipal Solid Waste



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## MSW Disposal



### There are two types of MSW Disposal:

- [Solid Waste Landfills](#) - includes municipal solid waste, industrial waste, construction and demolition debris, and bioreactors.
- [Solid Waste Combustion/Incineration](#) - waste volume is reduced in a controlled burning process called combustion or incineration.

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Last updated on Wednesday, February 22nd, 2006  
URL: <http://www.epa.gov/epaoswer/non-hw/muncpl/disposal.htm>

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## Solid Waste Landfills

Modern landfills are well-engineered facilities that are located, designed, operated, and monitored to ensure compliance with federal regulations. Solid waste landfills must be designed to protect the environment from contaminants which may be present in the solid waste stream. The landfill siting plan—which prevents the siting of landfills in environmentally-sensitive areas—as well as on-site environmental monitoring systems—which monitor for any sign of groundwater contamination and for landfill gas—provide additional safeguards. In addition, many new landfills collect potentially harmful landfill gas emissions and convert the gas into energy. For more information, visit EPA's [Landfill Methane Outreach Program](#).



There are several types of solid waste landfills:

- [municipal solid waste](#)
- [bioreactors](#)
- [construction and demolition debris](#)
- [industrial waste](#)

### Municipal Solid Waste Landfills

Municipal solid waste landfills (MSWLFs) receive household waste. MSWLFs can also receive non-hazardous sludge, industrial solid waste, and construction and demolition debris. All MSWLFs must comply with the federal regulations in 40 CFR Part 258 (Subtitle D of RCRA), or equivalent state regulations. Federal MSWLF standards include:

- **Location restrictions**—ensure that landfills are built in suitable geological areas away from faults, wetlands, flood plains, or other restricted areas.
- **Composite liners requirements**—include a flexible membrane (geomembrane) overlaying two feet of compacted clay soil lining the



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bottom and sides of the landfill, protect groundwater and the underlying soil from leachate releases.

- **Leachate collection and removal systems**—sit on top of the composite liner and removes leachate from the landfill for treatment and disposal.
- **Operating practices**—include compacting and covering waste frequently with several inches of soil help reduce odor; control litter, insects, and rodents; and protect public health.
- **Groundwater monitoring requirements**—requires testing groundwater wells to determine whether waste materials have escaped from the landfill.
- **Closure and postclosure care requirements**—include covering landfills and providing long-term care of closed landfills.
- **Corrective action provisions**—control and clean up landfill releases and achieves groundwater protection standards.
- **Financial assurance**—provides funding for environmental protection during and after landfill closure (i.e., closure and postclosure care).

Some materials may be banned from disposal in municipal solid waste landfills including common household items such as paints, cleaners/chemicals, motor oil, batteries, and pesticides. Leftover portions of these products are called [household hazardous waste](#). These products, if mishandled, can be dangerous to your health and the environment. Many municipal landfills have a household hazardous waste drop-off station for these materials.

More information on municipal solid waste landfills:

- [Solid Waste Incineration/Combustion](#)
- [Municipal Solid Waste Collection Efficiency](#)
- [Municipal Solid Waste Landfill Regulations and ICRs](#)
- [Solid Waste Landfill Publications](#)

## Bioreactor Landfills

[Bioreactors](#) are municipal solid waste landfills that are designed to quickly transform and degrade organic waste. The increase in waste degradation and stabilization is accomplished through the addition of liquid and, in some cases, air to enhance microbial processes. Bioreactors are a new approach to landfill design and operation that differ from the traditional "dry tomb" municipal landfill approach.

## Construction and Demolition (C&D) Debris Landfills

These landfills accept only [C&D debris](#) such as concrete, asphalt, brick, wood, drywall, asphalt roofing shingles, metals, and some types of plastics generated during the construction and demolition of homes, commercial

buildings, and other structures. C&D landfills are subject to less stringent standards than municipal solid waste landfills due to the relatively inert nature of C&D debris materials.

### **Industrial Waste Landfills**

These landfills are designed for the management of non-hazardous [industrial process wastes](#). Industrial waste consists of a wide variety of non-hazardous materials that result from the production of various goods and products. Industrial waste landfills are subject to the federal requirements in 40 CFR Part 257, Subparts A and B, as well as any state-specific regulations.

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## Solid Waste Combustion/Incineration

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To reduce waste volume, local governments or private operators can implement a controlled burning process called combustion or incineration. In addition to reducing volume, combustors, when properly equipped, can convert water into steam to fuel heating systems or generate electricity. Incineration facilities can also remove materials for recycling.

Over one-fifth of the U.S. municipal solid waste incinerators use refuse derived fuel (RDF). In contrast to mass burning—where the municipal solid waste is introduced "as is" into the combustion chamber—RDF facilities are equipped to recover recyclables (e.g., metals, cans, glass) first, then shred the combustible fraction into fluff for incineration.

A variety of pollution control technologies significantly reduce the gases emitted into the air, including:

- Scrubbers—devices that use a liquid spray to neutralize acid gases
- Filters—remove tiny ash particles

Burning waste at extremely high temperatures also destroys chemical compounds and disease-causing bacteria. Regular testing ensures that residual ash is non-hazardous before being landfilled. About ten percent of the total ash formed in the combustion process is used for beneficial use such as daily cover in landfills and road construction.

### Related Topics

[Electricity from Municipal Solid Waste \(MSW\)](#)



**Burning MSW can generate energy while reducing the amount of waste by up to 90 percent in volume and 75 percent in weight.**

This EPA Web site explains how MSW can be directly combusted in waste-to-energy facilities to generate electricity. Because no new fuel sources are used other than the waste that would otherwise be sent to landfills, MSW is often considered a renewable power source.

[Combustion and Incineration Regulations: 40 CFR Part 60](#) (Subchapter C—Air Programs)

Combustion and incineration regulations are codified in 40 CFR Part 60, including emissions guidelines and compliance times for municipal waste combustors.

[Research on Municipal Waste Combustion \(MWC\) Pollutant Formation and Control Mechanisms](#)

EPA's Air Pollution Technology Branch (part of EPA's National Risk Management Research Laboratory) conducts research on air pollutant emissions generated during the process of municipal solid waste combustion.

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