



Municipal Solid Waste Landfills

What are the environmental and local economic impacts of municipal solid waste landfills?

Municipal solid waste landfills produce pollutants that are potentially harmful to humans.

Municipal solid waste landfills (MSWLs) are areas of land that collect non-hazardous household waste.

- On average, each Missourian produces over one ton of solid waste yearly ([MDNR 1 n.d.](#)).

Landfill gas. Waste decomposing in landfills generates gases, about 50% methane and 50% carbon dioxide ([EPA 2023](#)).

- MSWLs are the third largest source of human methane emissions in the U.S. (14.5% in 2020), behind agricultural animals and the energy sector ([EPA 2023](#); [MOST 2022](#)).
- Factors influencing landfill gas production include the type of waste, moisture content, temperature, and landfill age.

Leachate. Leachate is formed when water filtering through a landfill is contaminated by waste (e.g., microplastics, nutrients) or other chemicals (e.g., metals, toxic compounds; [EPA 2022](#); [Vavrková 2019](#); [Wang 2023](#)).

- Contaminants vary based on waste composition, local climate or season, rainfall, and landfill age ([Moody 2017](#); [Vavrková 2019](#)).

Research Highlights

Municipal solid waste landfills produce potentially hazardous pollutants.

Federal and state regulations mitigate environmental pollution and health risks.

Landfills decrease nearby property values and may increase adverse birth outcomes.

MSWLs impact local property values and may increase adverse birth outcomes.

There is limited research on the characteristics of non-hazardous waste sites.

- MSWLs are more likely to be in counties with higher poverty and greater minority populations ([Cannon 2020](#); [McKinney 2015](#); [Smith 2007](#); [Bullard 1983](#)).

Health and economic impacts of MSWLs often depend on proximity and size.

Health. Humans may be exposed to MSWL pollution via the air, or by leachate contamination of the soil, ground, and water.

- Studies have not come to strong conclusions on how likely these types of exposure are, or whether air or water exposure is more likely ([Vrijheid 2000](#)).

Research on whether living near a MSWL negatively impacts health is complicated by several factors ([Vrijheid 2000](#)).

- It is often difficult to identify how residents near a MSWL are exposed to pollutants.

- Exposure is typically in low doses, making associating specific exposures with increased health risks difficult.

There is some evidence of health risks due to living near a MSWL on adverse birth outcomes, increased risk of mortality, respiratory conditions (e.g., increased rates of pneumonia, sleep-related disorders, and bronchitis), and negative mental health effects associated with living near a MSWL ([Vrijheid 2000](#); [Vinti 2021](#)).

- There is not enough evidence to establish a strong relationship between health risks and specific exposures (e.g., air pollution or leachate contamination).

Local economic impacts. Landfills can generate unpleasant odors, particularly downwind of a landfill site ([Palmiotto 2014](#)).

- Covering closed solid waste facilities can significantly reduce the perception of odors in nearby towns ([De Feo 2013](#)).

Landfills that accept 500+ tons of trash per day decrease neighboring residential property values by about 14% on average ([Ready 2010](#)). The negative economic impact decreases by about 6% per mile away from the landfill.

- Smaller landfills (less than 500 tons per day) decrease neighboring residential property values by about 2.7% on average. Values rebound by 1.3% per mile away from the landfill ([Ready 2010](#)).
- The impact on property values may remain even after a landfill has closed ([Hite 2001](#)).

Federal and state regulations protect against environmental pollution and health risks.

The U.S. Resource Conservation and Recovery Act, Subtitle D sets federal regulations for several aspects of MSWLs, such as ([EPA 2022](#)):

Location. MSWLs cannot be built in certain areas (e.g., near wetlands and floodplains).

Leachate. MSWLs must be lined with a membrane that protects groundwater and the underlying soil from leachate. Equipment must be installed to remove leachate from MSWLs for treatment and disposal.

Monitoring. Groundwater must be tested at least twice a year to determine if waste has leaked from a MSWL.

Closure. Owners must install a final cover over the MSWL and ensure that the cover, leachate collection, and groundwater monitoring systems work for 30 years after closure. States may adjust this timeframe.

Financing. All MSWL owners and operators must be able to pay for closures and any corrective actions if MSWL contaminants leak into the surrounding environment.

State Policies

States primarily ensure that federal regulations are met, and may choose to set stricter regulations ([EPA 2022](#)).

There are 17 MSWLs in MO ([MO DNR](#)). The MO Dept. Of Natural Resources permits MSWLs based on what solid wastes they can accept ([MDNR 2 n.d.](#)).

- Restricted forms of waste (e.g., hazardous, high-volume liquids, waste oil, appliances, lead-acid batteries, vegetation) must go to designated waste facilities ([MDNR 3 n.d.](#)).

MSWL permitting takes an average of 5 years.

Violations of MSWL regulations can result in a penalty of up to \$1000 per day the violation occurred ([RSMo 260.240](#)).

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