

Every day, more than 1.3 billion gallons of wastewater, from homes, businesses, and schools, flow through the sewer system to one of New York City's 14 Wastewater Resource Recovery Facilities. Most sewer pipes carry a mixture of wastewater and stormwater runoff from streets, sidewalks, and rooftops.

During the wastewater treatment process, pollutants are removed from wastewater before clean water is released to local waterways. Today, the City's wastewater resource recovery facilities also recover energy, nutrients, and other resources from the treatment process.

This graphic illustrates the five major processes of wastewater treatment: preliminary treatment (screening and pumping), primary treatment, secondary treatment (aeration and final settling), disinfection, and sludge treatment.

## Key Terms

**Biogas** - The methane gas released during sludge digestion can be used to produce heat and electricity for a wastewater resource recovery facility. Once purified it can be distributed as natural gas for the community.

**Bioslurry** - A nutrient rich mixture of processed food scraps from stores, restaurants, schools, and businesses.

**Biosolids** - The solid by-products of the wastewater treatment process that can be composted, added to agricultural soils, or further processed for other beneficial uses.

**Sludge** - The organic solids, such as food, feces, and paper fibers, that are removed from wastewater during the treatment process.

**Stormwater runoff** - The precipitation that falls on streets, sidewalks, and rooftops and flows overland, rather than being absorbed naturally into the ground.

**Wastewater** - The used water mixed with solid waste that flows down the drains from homes, schools, and businesses.

**Wastewater Resource Recovery Facility** - A facility designed to treat wastewater and stormwater runoff before releasing clean water into a nearby waterway. These facilities recover energy, nutrients, clean water, and other resources from the treatment process.



## Want to learn more?

Visit our website for additional information and to learn how you can help protect New York City's wastewater treatment system and local waterways, at

[nyc.gov/dep](https://nyc.gov/dep)

Also, find out how you can see the wastewater treatment process come to life at the Visitor Center at the Newtown Creek Wastewater Resource Recovery Facility.

If you have questions, email DEP Education at

[educationoffice@dep.nyc.gov](mailto:educationoffice@dep.nyc.gov)



# Wastewater Treatment in New York City



Start

STORMWATER, WASTEWATER FROM HOMES, BUSINESSES, AND SCHOOLS

FOOD WASTE

Food scraps are collected from homes, schools, and businesses and processed off-site into a nutrient-rich mixture called bioslurry. This material is mixed in with the sludge to help produce more biogas during sludge digestion.

SLUDGE DIGESTION

Thickened sludge is digested by microorganisms that thrive in a low-oxygen environment heated to about 98°F. Biogas, released during this process, can be used to produce heat and electricity for the facility and also purified and distributed as natural gas for the community.

COMPOST

LAND APPLICATION

OTHER BENEFICIAL USE

LANDFILL

Output

STORMWATER

Some sewers carry stormwater runoff directly to a nearby waterway.

WASTEWATER

Wastewater, from homes, businesses, and schools, flows through sewer pipes beneath the street to one of NYC's 14 Wastewater Resource Recovery Facilities. Most sewer pipes carry a mixture of wastewater and stormwater runoff from streets, sidewalks, and rooftops.

SCREENING + PUMPING

As wastewater enters the facility, it passes through bar screens to remove leaves, twigs, and litter such as plastic bags, food wrappers, bottles, and sanitary wet wipes. Trash and debris are collected and trucked to landfills. Main sewage pumps then pump wastewater from the screens to the surface level of the facility.

PRIMARY SETTLING

Lighter solid material, such as grease, floats to the top of the primary settling tanks, while heavier solids, called sludge, sink to the bottom. Sludge is removed for thickening and digestion.

AERATION

Air is added to foster a healthy environment for oxygen-loving microorganisms. These helpful microorganisms consume much of the organic material in wastewater.

FINAL SETTLING

Remaining solids settle to the bottom of final settling tanks. Most of this activated sludge is removed and combined with primary sludge for thickening and digestion, while some is returned to the aeration tanks to help process incoming wastewater.

DEWATERING

Water is removed from solids using large centrifuges. Since not all DEP facilities have dewatering on-site, marine vessels are used to transport treated solids to facilities with dewatering capabilities. These dewatered biosolids can be composted, applied to land or further processed for other beneficial uses.

# NYC Environmental Protection Wastewater Treatment

