



The most advanced organic treatment technologies  
for contaminated materials.

# Your expert source for environmental solutions.

Increasingly, our customers are turning to us to not only manage their waste streams but help them create less of it and derive higher value from these materials. While our focus is to continue to lead the industry in the collection, recycling and disposal of waste, we are also charting a course for the future growth in the management of waste.

## Plastics Recovery and Conversion into Base Petroleum

Plastics such PET and HDPE are common in industrial waste streams and can easily be recycled into new high-value materials. However, many other plastics — including LDPE, PP, PS and other resins — are more difficult to recycle.

Waste Management has partnered with a technology provider that converts low-value, difficult-to-recycle industrial and consumer plastics as well as contaminated and recycling residual plastics into a high-value synthetic crude oil, which can be converted into ultra-low sulfur diesel and other transportation fuels and petroleum products.

This emerging waste plastic conversion technology is a pyrolysis process that seeks to provide an economical and environmentally responsible solution to process mixed plastic resins from industrial and residential waste streams. The system gasifies waste plastic, purifies the gaseous compounds and then condenses the gas-phase hydrocarbons back into synthetic crude. The technology is intended to convert low-value plastics into a high-value, beneficial resource.

## Thermochemical Technologies

Waste Management is also working with various technology partners on initiatives involving gasification, plasma and pyrolysis technologies that process a variety of waste streams. When these waste streams are converted into a syngas, an array of value-added products can be potentially created, including electricity, transportation fuels and chemicals.

These technologies complement Waste Management's other waste processing services and are intended to provide a variety of waste-to-biofuels solutions, which is key to developing new, higher value-added end markets for waste materials in the future.

This technology treats hard-to-recycle plastics such as hard-body computer cases, broken plastic toys, plastic bags, and many other items. The process converts the plastics into crude oil, which can then be further refined and used to make gasoline, jet fuel, and new plastics.

Waste Management has invested over several years in a diverse portfolio of conversion technology platforms to determine if they are scalable and economic. With the prospect of converting organic energy into biofuels still in various stages of development, not every initiative in our range of investments is certain to succeed. We will continue to nurture, evaluate and scale up the most viable conversion technologies that match our ongoing strategy of extracting more value from waste.

# Your source for innovative conversion technologies.

Waste Management offers a variety of treatment and remediation solutions using proven technologies that have been scaled to make them economically feasible.

We provide treatments and processes that remove organic contaminants through either the use of heat or microorganisms, which return soil or other media into usable material. In addition, we are taking advantage of innovative conversion technologies to recover valuable resources contained in select organic material.

Our organics services are available at a variety of locations across the country. Whether your treatment priorities are driven by economics, transportation haul distances, technological preferences, or environmental stewardship, Waste Management can assess each of the available options and recommend the solutions most appropriate to your needs.

Our mission is to help your business achieve its financial and sustainability goals. Rely on our innovative solutions-based matrix to provide comprehensive options, backed by the knowledge, experience and vast resources of North America's leading environmental services company.

Waste Management provides industry leading services, backed by state-of-the-art site design and management systems, to minimize risks and reduce liabilities.

## Thermal Desorption

Low-Temperature Thermal Desorption, known as LTDD, is a permanent, environmentally responsible solution for treating soils or other media contaminated with hydraulic oils, jet fuels, crude oil, volatile organic compounds, and other non-hazardous organic and petroleum materials. The process is widely accepted and economically competitive.

With LTDD, the soil is enclosed in a chamber and heated to temperatures > 800° Fahrenheit. This extreme heat causes the contaminated material to volatilize and physically separate from the soil or other media so it can be either collected or thermally destroyed.

The result is clean, contaminant-free media and soil. Clean soil can then be returned to the original excavation site, used as cover in landfills, or incorporated into asphalt.

Thermal Desorption enables you to:

- Protect the environment by using a green solution for handling contaminated media
- Significantly reduce the amount of material going directly to landfill
- Pursue project opportunities that require non-landfill remediation solutions

Waste Management operates a fixed-base Thermal Desorption Unit located in Azusa, California, as well as a Mobile Thermal Desorption Unit that enables us to bring the technology to your project location.

Find out how we can help your company develop a solutions matrix for managing your remediation needs.





## Organics Recovery Unit (ORU)

Waste Management's Organics Recovery Unit, located in Arlington, Oregon, uses indirect heat to drive organic material and water from soil or other media. The liberated organic vapors and water are then condensed in a multi-stage system, and the resulting liquids can be recycled into fuel. Our ORU can benefit your company by:

- **Lowering remediation expenses.** Our Organics Recovery Unit offers an environmentally friendly solution that is cost effective and energy efficient, and that yields a product that meets federal and state treatment standards.
- **Reducing liability.** An alternative to incineration, our ORU facility can accept a wide range of contaminated material, including process-generated sludges and soils, and treats them according to the highest standards of environmental responsibility.
- **Regulatory compliance.** Thermal remediation offers a fast and effective organics treatment method that enables companies to pursue remediation projects requiring high regulatory-based treatment performance levels.
- **Environmental stewardship.** The ORU supports environmental performance objectives for organics recovery and can play an important role in your company's drive toward sustainability.
- **Beneficial reuse.** After the thermal process is complete, the oils are separated from the condensed liquids and may be recycled as fuel.

### OUR ORGANICS RECOVERY UNIT IS SUITABLE FOR:

- Chlorinated solvents
- Organic dyes and dye intermediates
- Pesticides and herbicides
- Process wastes
- Refinery wastes
- Semi-volatile organics
- Volatile Organic Compounds (VOCs)



## Bioremediation

On-site remediation of soils and media contaminated with petrochemicals, pesticides, explosives or hazardous organic materials can be expensive and time consuming. Waste Management offers an innovative, off-site bioremediation solution that delivers efficient and effective advantages over on-site remediation or other traditional treatment methods.

Our organic technologies typically cost less than treating the soil either at the original site or an interim location. We have the ability to manage large daily volumes that will reduce on-site labor and equipment costs. Our solution also includes stabilization of heavy metals and pre-treatment of free liquids that may be present. And, when a landfill is the soil's ultimate destination, it allows for controlled access to fully equipped, insured and permitted waste sites.

Our Bioremediation services include:

- **Bio-in-a-Box<sup>SM</sup>** is our system for remediating petrochemical-contaminated soils in quantities of 100 cubic yards or less. The contaminated soil is moistened, mixed with nutrients and custom-grown microorganisms, then incubated in closed containers. A few weeks later, decontamination is complete, and the soil is ready for landfill disposal or reintroduction into the environment.
- **The Bio-Site<sup>SM</sup> System** is the method we use for remediating petrochemical-contaminated soils in quantities greater than 100 cubic yards. The soils are placed in a ventilated biopile, then treated with a blend of selected chemicals and microorganisms that naturally break down the toxins into less harmful compounds. Treated soils can be safely landfilled or employed for other uses.
- **Daramend<sup>®</sup>** accelerates bioremediation of soils containing high concentrations of creosote, PCPs, PAHs, heavy oils, and petroleum hydrocarbons. This product utilizes organic amendments that create aquatic microsites, which then allow microorganisms to grow, contact contaminants, and ultimately degrade the contaminants. Waste Management licenses Daramend from Adventus Remediation Technologies.
- **TOSS<sup>SM</sup> Two-Step Static System.** For soils contaminated with explosives, our treatment process uses anaerobic and aerobic processes to achieve TNT-removal efficiencies greater than 99%.

### RELY ON BIOREMEDIATION TECHNOLOGY FOR:

- RCRA-listed and characteristic hazardous waste
- Petrochemical wastes
- Aliphatic chlorinated hydrocarbons
- Chemical manufacturing wastes
- Pesticides
- Spent molecular sieve from packing towers





## A full slate of environmental solutions.

Waste Management has the experience and breadth of solutions only available from a national environmental solutions provider. Our vast resources enable us to maximize efficiencies, saving you time and money as we work to understand your needs and address them safely, responsibly, and economically.

**For further information about Waste Management's organics technologies and to see which are available in your area, contact your Waste Management representative at 800 963 4776 or visit [wmsolutions.com](http://wmsolutions.com).**