



STATUS OF ORGANIC WASTE MANAGEMENT IN WESTERN MICHIGAN

SPONSORED BY:
KENT COUNTY DEPARTMENT
OF PUBLIC WORKS
MARCH 15, 2021

EXECUTIVE SUMMARY

In 2016, Kent County Department of Public Works (DPW) adopted an aggressive goal to reduce waste going to landfills by 20% by 2020 and 90% by 2030. This goal is intended to bring focus, public-private investment and the necessary infrastructure to West Michigan to achieve a landfill diversion goal that benefits the environment, economy and residents.

This report was sponsored by the Kent County Department of Public Works to help understand the current status of organic waste management and develop a strategy to manage organic materials, the largest single category of material in municipal solid waste. Organic materials comprise approximately one-third of the materials accepted at Kent County's South Kent Landfill and Waste-to-Energy (WTE) Facility. Achieving the goal of 90% reduction by 2030 will not be possible without a successful strategy to separate, process and repurpose the organic materials generated by Kent County residents and businesses.

The State of Michigan is in the process of updating its 45-year-old solid waste regulations and re-envisioning its waste strategy from a focus on disposal to one that aims to extract value through a sustainable materials management perspective. The Department of Environment, Great Lakes, and Energy (EGLE) has worked with stakeholders to develop and submit draft legislation to the House and Senate which will redefine organic waste. This report uses those new classifications of organic material as a starting point for understanding current conditions and developing a plan for a more efficient and productive future for organic management in West Michigan.

There is a well-established organics management system for yard waste and woody brush that relies on municipal or waste hauler involvement in the collection and/or transportation of yard waste to municipal and privately-owned processors. Separating yard waste was driven by changes in state statute banning yard waste going to landfill. However, because the foundation of this system is based solely on private companies, it is an unstable approach that fluctuates with the economy. Additionally, there is rapidly growing consumer interest in addressing the enormous amount of food waste that is embedded in our current food supply chain. Some estimates show that as much as 40% of all food ends up as waste in disposal facilities. In two recent DPW recycling surveys, most respondents (52%) said that they wanted to recycle food waste and other organics but could not find a commercial or municipal service provider.

An economic assessment of materials disposed of in the South Kent Landfill in 2017 estimated that as much as 230,000 tons of mixed organics are disposed of on an annual basis. Although the assessment did not assign an economic value at the time, if captured and converted to marketable compost and sold at its current price, the value could be as high as \$9,000,000 per year. Even though the region has several small composting operations, West Michigan still lacks compost processing at a scale that could take advantage of the potential to extract the full market value.

This report outlines why it makes sense for the DPW to take an active role in organic waste management, including the potential economic value and development of a circular economy, the benefits of lower greenhouse gas emissions from organic waste breakdown in landfills and the benefits of adding compost to soils for improved soil health and increased crop yield for the region's agricultural industry.

Summary of findings in the organic management system:

1. A more aggressive approach to organics management is required in order to reach waste diversion goals.
2. State Solid Waste Management regulations are changing to emphasize sustainable materials management leaving disposal as a last response.
3. The existing organics management system in the region is based largely on yard waste and organics processing capacity for food waste is limited.
4. The existing organics management in the region is primarily available in urban areas and leaves some suburban, exurban, and rural communities with few options.
5. There is growing public interest in food waste composting, making the lack of collection and processing capacity even more important for the region.
6. The economic value of organic materials is largely unrecognized.
7. There are quantifiable environmental and social benefits of properly managing organics.
8. The Kent/Allegan County Sustainable Business Park is reserving space for organics processing operations.

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INTRODUCTION

Michigan banned most yard waste from disposal in municipal solid waste landfills in 1994¹ and required composting facilities to register with the Department of Environmental Quality, now EGLE, beginning in 2008. Minimal state oversight of compost facilities has led to issues including nuisance odors and contaminated runoff into local waterways, which make it difficult to site new compost facilities.² To address these issues and prepare for a new sustainable materials strategy that prioritizes waste utilization instead of disposal, legislative revisions to the State's solid waste law are being considered in the House and Senate.

According to the Michigan Recycling Coalition's Recycling Measurement Project Report of 2001, organic waste made up approximately 29% of Michigan's municipal waste stream in 1999. At that time, there were 163 compost sites managing only about 10% of the state's organic waste. More recent studies confirmed the estimated amount of organic waste disposed at licensed disposal sites ranges from 25-35% of all waste received. With yard waste being eliminated from municipal solid waste and banned from landfilling and waste-to-energy, a large and growing fraction of organic waste is coming to these facilities from residential and commercial food waste generation. The organic fraction of disposed material has been largely overlooked in past national and state recycling strategies.

Potential Impact from Proposed Revisions to State Solid Waste Laws

Michigan solid waste law is the foundation for planning, development and oversight of waste materials management. The current law was written at a time when disposal capacity was limited and siting landfills was the cornerstone of waste management. While technologies have since advanced to better manage discards, the abundance of landfill airspace has created an economic disincentive for alternative management of municipal solid waste and recyclables. The changes to solid waste law currently being proposed are intended, in part, to:

- Provide a policy framework to support productive materials management as an economic driver
- Update and broaden county planning processes to encourage sustainable materials management
- Ensure adequate local capacity for managing materials
- Prioritize local control of facility siting and regulation of landfill development
- Require adequate financial assurance for all permitted facilities, including landfills
- Allow for the development of new recycling technologies and facilities
- Establish benchmark standards to ensure access to recycling opportunities across the state

1 unless the material is diseased, infested, or composed of invasive species

2 2017 Michigan Solid Waste and Sustainability Advisory Panel report

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- Specify local funding mechanisms that can be used to support materials management
 - Preserve the ability to flow material to publicly managed facilities
 - Eliminate import/export authorizations for disposal
 - Support business commitments to a circular economy

The State of Michigan proposes to redefine organic waste as follows:

Class 1: compostable material is (any mixture of) yard waste; wood; food waste; paper products; manure or animal bedding; anaerobic digester digestate that does not contain free liquids; compostable products; dead animals unless infectious or managed under other state laws; spent grain from breweries; paunch; food processing residuals; aquatic plants; any other material, including, but not limited to, fat, oil, or grease (FOG).

Class 2: compostable materials as mixed municipal solid waste, biosolids, state or federal controlled substances and all other compostable material that is not listed or approved as a class 1 compostable material.

Yard clippings: Grass clippings, brush, leaves (Class 1). According to state law, “Yard clippings” means leaves, grass clippings, vegetable or other garden debris, shrubbery or brush or tree trimmings, less than four feet in length and two inches in diameter, that can be converted to compost. Yard clippings do not include stumps, agricultural wastes, animal waste, roots, sewage sludge or garbage. Yard debris can be generated by homeowners or by commercial landscape maintenance companies.

Storm debris: Clean woody debris generated during storms and natural disasters (tornado, flooding, ice) (Class 1). Storm debris consists of large amounts of wood and tree debris including fallen branches, limbs or whole trees. It is generated in large volumes over short periods of time.

Food loss: Including waste food from residential, commercial or agricultural sources (Class 1). Food waste comprises the single largest component of the waste stream by weight. Nationally we throw away more than one-quarter of all prepared food, approximately 96 billion pounds each year. Food waste includes preparation waste and scraps, as well as uneaten food from households, commercial, institutions (i.e. school cafeterias) and industrial sources such as food processors.³

SOURCES OF ORGANIC WASTE

In 2009, the USDA's Economic Research Service (ERS) defined food loss as the edible amount of food, postharvest, that is available for human consumption but is not consumed for any reason. It includes cooking loss and natural shrinkage (such as moisture loss); loss from mold, pests or inadequate climate control; and wasted food. ERS estimates that \$161 billion of food at the retail and consumer stage of the supply chain goes uneaten annually. Through the entire supply chain, the Food and Agriculture Organization of the United Nations estimates that 30% of global food loss occurs at the agricultural production and harvest stage, 6% at post-harvest, 3% at processing and packaging, 18% at retail and distribution and 42% at consumption. Nationally, the USDA estimates that as much as 40% of purchased food is wasted.

West Michigan disposes of an estimated 132,000 tons of food waste through its municipal waste stream each year, the single largest source of material disposed in landfills and the waste-to-energy facility.⁴ Businesses and institutions generate a slight majority of food waste, according to the Food Waste Reduction Alliance.

Wasted Food: There are several sources of wasted food. Households toss limp vegetables, as many people are confused by food date labels and unnecessarily discard uneaten food. Restaurants and home cooks often prepare and serve large portions and discard leftovers. Grocery stores overstock their shelves to maintain an image of abundance. Farmers are unable to sell produce that doesn't look perfect or dump it due to economic variabilities.⁵

Approximately 72 billion pounds of perfectly good food—from every point in the food production cycle—ends up in landfills and incinerators every year. There are organizations trying to rescue this edible food before it gets to disposal in order to feed families facing hunger and to protect the planet and conserve resources.⁶

In agricultural applications, food may be left unharvested in a field or not sold by a distributor for a variety of economic reasons, including price volatility, labor cost, lack of refrigeration infrastructure, consumer preferences, quality-based contracts and various policies related to produce.⁷ Every effort needs to be made to keep food from reaching a disposal facility and going to waste.

De-packaging: For packaged prepared food or ingredients to be composted or otherwise disposed in a non-landfill, non-combustion process, the inorganic components must be separated from the organic components. Examples include boxed crackers or cookies sealed inside a plastic bag inside a fiber container, fresh produce inside a plastic bag or container, food and liquid contained in a plastic or glass bottle or jar, or bakery products sold in plastic containers. De-packaging can be done manually or mechanically through the separation of the food (organic) material from the package (non-organic) material. Depackaging enables the capture of approximately 70-95% of the organic material, depending on the type of process used, type of package and the type of organic material (solid vs liquid).

4 West MI Sustainable Business Forum Food Recovery Council

5 Natural Resources Defense Council

6 Feeding America

7 USDA Economic Research Service

Industrial by-products: Solid waste that is generated by manufacturing or industrial processes and that is not a hazardous waste regulated under part 111, such as homogenous organic matter (wood, textiles, plant material, spent grain) (Class 1).

Regional manufacturing produces organic industrial by-products, including:

- Wood
- Textiles, often durable and high quality from furniture or automotive industries
- Plant material from greenhouses
- Spent grain from breweries
- Stillage from distilleries
- Pomace from wineries
- Fruits or vegetables from food processing
- Animal parts
- Gypsum or other mining co-products

Western Michigan hosts one of the largest concentrations of office furniture manufacturing capacity in the world. Many of the products they produce are composed of a high percentage of composite wood products (e.g., particle board, oriented strand board or medium density fiberboard), these products often contain external laminates, plastic bandings and internal glues and epoxies. The composition makes these products difficult to recycle and has caused large amounts of manufacturing offal to be disposed of in Kent County facilities.

Agricultural by-products: Waste containing manure, animal bedding, dead animals will be considered Class 1, if not infectious. In the proposed state law, animal bedding means a mixture of manure and wood chips, sawdust, shredded paper or cardboard, hay, straw or other similar fibrous materials normally used for bedding materials. Manure is often managed on-farm.

Unrecyclable paper products: Waste recovered from mixed municipal solid waste (Class 2), fiber and any other organic material, that has been in contact with mixed municipal solid waste. This material has limited outlets as a finished compost product and considered “restricted use compost” because it has not been approved as inert according to state law.

AVAILABLE TECHNOLOGY OPTIONS FOR MANAGING ORGANIC MATERIAL

Composting: A managed process which utilizes microorganisms that feed on organic material and consume oxygen. The process generates heat, drives off moisture and reduces bulky organic waste in just a few months into a beneficial soil-like material containing nutrients, humus and microorganisms. Compost heat is produced as a by-product of the microbial breakdown of organic material. The heat production depends on the size of the pile, its moisture content, aeration and Carbon to Nitrogen (C:N) ratio. Additionally, indoor and outdoor ambient temperature affects compost temperatures. The end-product is compost, a dark brown, humus-like material which can be easily and safely handled, stored and used as a valuable soil conditioner.⁸

A composting facility is a processing facility where yard clippings, food waste or other organic materials are brought to be processed and converted into compost. The composting facility uses mechanical handling techniques such as, grinding/shredding, physical turning, windrowing, aeration or other management techniques that convert raw materials into finished compost. Commercial composting facilities are usually better managed and faster than a non-commercial operation and can generate more heat allowing them to break down a wider array of organic material.

Composting can also occur on the site where it's generated, like a residence. Low technology/low-cost compost piles or bins can be made to easily decompose food scraps generated at home. Home composting bins do not normally generate enough heat to break down complex items such as compostable plastics. Additionally, some municipalities ban outdoor composting on-site due to concerns over vermin and odors.⁹

Due to historically poor composting methodology by homeowners, most cities in Western Michigan have passed local ordinances prohibiting residential composting because of public health concerns.¹⁰

8 UMass

9 Rodale Institute

10 American Biogas Council

Vermicomposting: The product of earthworm digestion and aerobic decomposition using the activities of macro- and microorganisms at room temperature. Vermicomposting, or worm composting, produces a rich organic soil amendment containing a diversity of plant nutrients and beneficial microorganisms.

Anaerobic digestion: An enclosed engineered digester system that goes through a series of biological processes in which microorganisms break down biodegradable material in the absence of oxygen.

Rapid thermophilic digestion: An aerobic digestion system where microorganisms inside the waste break down with the presence of oxygen from the atmosphere. The system consists of two key components: proprietary enzymes and a digester. The system creates an accelerated degradation process to break down complex organic compounds into simpler organic matter.¹¹

Construction and Demolition Waste Recovery (C&D): Recovering, sorting, processing and aggregating materials used in building or demolishing roads, bridges, housing, etc. C&D debris includes steel, wood products, drywall and plaster, brick and clay tile, asphalt shingles, concrete and asphalt concrete. C&D is not included in municipal solid waste (MSW).

Biochar: Involves heating biomass (thermal decomposition), usually from pyrolysis or gasification, with little or no oxygen in order to drive off volatile gasses, leaving carbon behind. Biomass waste materials appropriate for biochar production include field crop and processing residues such as nut shells, fruit pits, bagasse, etc. It also includes wood from construction/demolition, yard, food and forestry wastes and animal manures. (International Biochar Institute). Fertilized (charged) biochar can be mixed with compost to add a slow release of nutrients and to increase water holding capacity for soils.

THE VALUE OF MANAGING ORGANIC MATERIAL

Composting, along with the available technologies for managing organic material lists above, provides a way to manage organic discards to the benefit of the environment. It reduces the production of greenhouse gases in landfills that contribute to climate change and diverts yard clippings and food residuals from taking up valuable space in highly engineered landfills. Compost replenishes the organic matter and nutrient value of soil and can be used to effectively reduce or eliminate soil erosion and filter stormwater discharge. Composting facilities provide local jobs and enhance the local economy by converting high volume-low value materials into a valuable commodity.

Impact on Climate Warming: According to the U.S. Environmental Protection Agency's 2018 Facts and Figures on Municipal Solid Waste, food scraps and yard trimmings make up the second and fourth largest portions of the MSW stream, 21.6% and 12.1% respectively (by weight). In a landfill these materials undergo anaerobic decomposition and produce methane. Methane (CH₄) is a greenhouse gas that remains in the atmosphere for 9-15 years and is over 20 times more effective at trapping heat in the atmosphere than carbon dioxide (CO₂) over a 100-year period. Some landfills are equipped to capture, up to 80% of the gases produced. However, most landfills are not equipped to capture landfill gases and they escape into the atmosphere. According to the U.S. EPA, landfills are the second largest source of methane emissions in the U.S. As a fundamentally aerobic process, well-operated compost sites do not produce significant amounts of methane and contribute considerably less to the production and release of climate changing greenhouse gases. Additionally, studies have shown that carbon sequestration was increased by 6-40 tons of carbon per hectare by mixing compost into soil compared to soil without added compost.

Impact on Waste Management: In order to reduce greenhouse gases from landfills, public pressure has focused on diverting yard waste from landfills and many states have responded by implementing yard waste composting programs and yard waste bans. Increasingly in the United States, composting is used to handle a variety of municipal solid wastes, agricultural residues (old hay/straw, animal bedding, manure, etc.), biosolids, food scraps and more. Smaller scale backyard composting is promoted as a means of reducing the total amount of yard waste that require collection and transportation to central composting facilities (EGLE Compost Manual). For organizations that own and manage landfills, composting can significantly increase longevity by diverting 25 to 35 % of waste received to a value-added composting facility.

Economic Impact: In addition to employment and supply chain purchasing impacts, the value of finished compost has an economic value as a desirable commodity of between \$25 and \$35 per cubic yard for use in landscaping and/or for agricultural soil amendment needs.

STATUS OF MANAGING ORGANIC MATERIALS IN WESTERN MICHIGAN

With composting, the community can do more than just return their cans or recycle their cardboard. They can participate in the entire cycle of taking “messy” food scraps or compostable plates to something that is pleasant to handle and is good for the soil. Contrary to the “out of sight, out of mind” philosophy, people who compost become aware of organic wastes as potential resources rather than just something to be thrown away and forgotten. They learn through direct experience that they personally can make a difference and have a positive effect on waste reduction and improving the environment.

Composting is a topic of growing interest to residents and businesses in communities throughout the country for several reasons:

- **Waste diversion:** Composting provides a partial solution to communities concerned with running out of landfill space. All around the country, waste volumes continue to increase, landfills are filling up, poorly managed waste incinerators are closing and other waste disposal options are becoming ever harder to find.
- **Waste conversion:** Composting provides a way of reducing the amount of waste that needs to be disposed of while converting it into a product that is useful for agriculture, gardening, landscaping or for augmenting soil quality in general.
- **Waste awareness:** Composting is a tangible way for the community to act as environmental stewards. Historically, most recycling education programs focus on reducing, reusing and recycling. Composting amplifies that message.

Finding a useful method of diverting organic waste will have an enormous, positive value by reducing the environmental and economic impacts of sending organic materials for disposal in landfills. Management of organic materials in the region offers the following benefits:

- Increases existing landfill capacity by up to 30%
- Reduces the amount of methane gas generation at landfills that needs to be managed or escapes into the environment
- Provides a value-added opportunity for compost related businesses to gain a foothold in the region (collection, processing/blending, marketing and sales), creating additional waste recovery jobs
- Creates a high-volume market to help increase the use of environmentally beneficial alternatives to chemical soil additives for improvement of soil structure, nutrient release and mitigation of soil erosion
- Lowers operation and maintenance costs at the landfill and WTE facility

Organics Services

Residential/Commercial yard waste

Yards and public spaces produce leaves, weeds, tree trimmings, frost-damaged vegetable plants and grass clippings. Yard waste recycling, also known as green waste, has become very popular in recent years and makes up a significant %age of the total waste stream. According to EGLE, yard waste makes up the second largest portion of the MSW stream in Michigan at 13.2% by weight (EGLE Compost Manual). Since the Michigan yard waste landfill ban, diverting this waste from disposal has saved a significant amount of landfill space in the state. However, there is another reason to recycle yard waste. These materials can do real environmental harm if they end up in a landfill and start to decay, contributing to unwanted methane gas emissions. Methane gas is a health and safety danger as well as a potent Greenhouse Gas (GHG). Alternatively, when yard waste is composted, aerobic bacteria cooperate with a host of other microorganisms to create a product with many beneficial properties. Compost gives nutrients back to plants, improves soil quality and helps conserve water by reducing runoff and increasing soil absorption.¹²

Food waste recycling

In the United States, total food supply waste is estimated to be between 30 and 40 % of the total amount of food produced. This is based on USDA estimates of 31% food loss at the retail and consumer levels.¹³ According to the US EPA's 2008 Facts and Figures on Municipal Solid Waste, food waste is the 3rd largest component of MSW entering landfills behind general refuse and nonfood organics. Kent County DPW's recent West Michigan Recycling and Landfill Diversion Survey (August 2020) found that 52% of the 164 respondents wanted to recycle food and other organic waste but could not find a commercial service provider. Although food waste composting is a rising public interest, there are not enough composting companies in Western Michigan to meet demand.

Commercial/Industrial byproducts recycling

In 2016, the West Michigan Sustainable Business Forum's Economic Impact Potential and Characterization of Municipal Solid Waste in Michigan reported that Kent County DPW disposal facilities received 586,105 tons of Municipal Solid Waste (MSW) of which 205,137 tons or 35% of the waste was composed of organics (i.e., food waste 12.6%; yard waste 5.6; soil 2%; wood 6.5%; and other miscellaneous organics 9%). A similar study conducted in 2017 by GBB, Inc. the Waste Characterization Study of Kent County evaluated the waste received for disposal at the Waste to Energy Facility (WTE) facility. The study identified that the organic portion of waste represented an estimated 27% of waste received at the WTE and generated by the commercial/ industrial sector. Food waste represented 8%, other organics such as yard waste, leaves, debris from trees (7%), and discarded wood pallets, composite wood panels (waste plywood, OSB, MDF), cotton, leather, soiled paper, etc. from local industries represented 12% of the total commercial/ industrial organics. In the WMSBF's economic assessment of the organics portion, even though it represented 35% of the total waste received, it was assigned zero dollars of value since there is not an organic waste management recycling system in Western Michigan at commercial scale to extract the value.

12 RecycleNation.com

13 USDA.gov food loss & waste

Historical development of composting services in Western Michigan

Industry cafeterias and restaurants seek solutions

Restaurants, institutions (hospitals, schools, government offices) and commercial/industrial cafeterias have led the demand for food composting services locally to reduce the food portion of organic materials sent to disposal. The composting leadership by commercial food operations helped initiate the development of the beginnings of the needed composting collection and processing services in Western Michigan. Several collection and processing companies began servicing residential and commercial communities in West Michigan (see details in service provider section).

Growing residential interest

At both the national and state levels, healthy living trends are driving adherents to consider what kind of food they consume and what happens to the food waste. Officials from some of the largest metropolitan centers in the West Michigan Region have received increasing interest from their residential and small business customers to expand the ability of their local waste systems to include a composting option. The City of Grand Rapids and the City of Holland are both revamping the delivery of their recycling services to include compost collection and processing. Currently, the composting trend is being led by urban residents where space is more limited for personal composting. However, the trend and demand for commercial composting will likely continue into the outlying suburbs and, eventually, rural residential areas.

Industrial by-products

According to respondents of the West Michigan Recycling and Landfill Diversion Survey (August 2020), 97% of manufacturers in the West Michigan Region divert materials from landfilling for typical waste materials (metals, cardboard, office paper, etc.). However, food preparation scrap, uneaten food and yard and wood scrap were identified as being problematic to recycle because there are currently no adequate collecting and processing composting services available.

HISTORICAL OVERVIEW OF LOCAL ORGANIC WASTE COLLECTORS AND PROCESSORS

Municipal Yard Waste Sites

Many municipalities in Kent County operate some level of yard waste service for their residents either out of necessity or due to resident demand. Each municipality organizes their program differently based on staffing, logistics and need. A chart showing basic service levels for each municipality can be found in Table 2. Summary of Public Information on Municipal Organic Management Programs.

City of Grand Rapids

For 28 years, the City of Grand Rapids has operated a yard waste site on Butterworth Avenue (sometimes referred to as the Domtar site). Through both curbside collection and self-haul, residents have been able to beneficially dispose of yard waste at this site. Some material is chipped on-site and offered back to residents for beautification projects and used in city parks and other public spaces. The remainder of the yard waste was hauled to Spurt Industries for composting until the City recently elected to build and operate their own compost operation on the Butterworth/Domtar site, expected to open in spring of 2021.

According to City staff, once site operations are running and stable, the City plans to include the collection of pre- and post-consumer food waste from commercial and residential customers with a goal of diverting 10% of current waste flow going for disposal. If the goal is met, the City could realize a potential savings of \$100,000 in WTE tipping fees.

Spurt Industries

Spurt Industries started as a cooperative business arrangement between Compost Soil Technologies and Waste Management, Inc. (WMI) in Zeeland, MI on property leased from

WMI at its Autumn Hills Landfill to offer yard waste composting. The operation eventually expanded to offer food waste processing and became the largest residential and commercial compost processing facility in West Michigan. They were used by most of the commercial hauling companies in the region that serviced food waste generators seeking a composting solution. However, in 2019, Spurt lost the City of Grand Rapids yard waste/composting contract to a competitor and closed their Zeeland composting site.

Organicycle

Organicycle offers a residential and commercial curbside subscription service that combines food waste, paper, cardboard and yard waste into one cart. They exclusively service Grand Rapids-area residents, local schools and area businesses. Organicycle operates as a collection service and does not operate its own compost processing facility. However, they are in the planning process to initiate a collaboration with an area farm to compost the material it collects and will work with the farm to use the resulting compost exclusively on land managed by the farm.

New Soil

New Soil is a division of Arrowaste, located in Jenison, MI. New Soil is a commercial-scale organic waste hauler servicing the West Michigan area by assisting restaurants, university dining halls and offices with zero-waste practices. New Soil collects pre- and post-consumer food residuals from both one-time community events and recurring weekly customers. New Soil collects but does not process organic waste into compost. New Soil transports collected organics to Cocoa Compost, Inc. in Holland Township for processing.

Cocoa Compost, Inc.

Located in Holland Township, Cocoa offers organic waste processing, including comprehensive solid, semi-solid and liquid organic residual collection services for businesses and municipalities on a contracted or emergency basis. Cocoa offers a licensed and insured compost facility. All approved organic residuals are transported and converted into Cocoa Compost, which is then sold to be used in agriculture, landscaping and in turf grass industries.

Urban Roots

Urban Roots is a not-for-profit community education organization located in the Southeast side of Grand Rapids. It offers educational programs, a community farm, a food market, and a compost service to many neighborhoods throughout the City. Compost services include providing collection containers and a scheduled collection of food waste. Collected waste is delivered to their own small-scale compost processing operation located on their property where finished compost is used in the community garden and is available for sale to the public.

Wormies Vermicomposting

Wormies is a composting business specializing in vermicomposting in Grand Rapids and Jenison. It began in 2017 and offers a variety of products and services. At the core of its operation is the production of worm castings for farm and garden use. Wormies provides a Community Supported Compost (CSC) service similar to Community Supported Agriculture (CSA), where customers pay a monthly fee for their food waste collection bucket. Food scraps are collected once a week or every other week. After eight pickups a member receives three pounds of Wormies premium vermicompost for their own use.

Perfect Circle

Based in Grand Rapids, Perfect Circle Recycling provides an alternative to traditional waste management by separating food waste from packaging. The collected food waste is transported to an anaerobic digestion unit to treat and convert to energy and the packaging is recycled. The operation opened in the summer of 2020. It provides the separation service and utilizes third-party businesses for transportation, treatment and package recycling.

Fremont Digester

The Fremont Regional Digester is a 2.85-megawatt anaerobic digestion facility in Fremont, Michigan. The digester takes in 165,000 tons of organic waste every year, including farm, animal, food processing and consumer food waste such as fruits, vegetables and dry ingredients. A digester converts organic waste into renewable energy that powers the community and fertilizer for local farms. The facility processes truckloads of liquid waste 24 hours per day, 7 days per week. A de-packaging operation separates food from its container, when necessary. The facility can provide a Certificate of Destruction to customers.

My Green Michigan

My Green Michigan is an organic waste aggregator and coordinator founded in 2015. They connect organic waste generators to haulers and composting operators to help divert waste from landfills. They provide collection carts and coordinate haulers with composting processors and provide a single billing system to their customers throughout Southern Lower Michigan including the Grand Rapids area. Although My Green Michigan does not operate a composting facility, they are affiliated with Hammond Farms, a composting company located in Dimondale, MI.

REGISTERED COMPOST PROCESSING OPERATIONS IN WESTERN MICHIGAN

Facilities that manage yard clippings (leaves, grass clippings, vegetable or other garden debris, shrubbery, or brush and tree trimmings less than four feet in length and two inches in diameter) are required to manage them using one of the following options:

- Composted at the property where they came from
- Temporarily accumulated under specific conditions at a site before moving to another location
- Composted at a farm registered with the Department of Agriculture under specific conditions
- Composted at a composting facility registered with the EGLE
- Composted and used under specific conditions at a licensed solid waste landfill
- Composted at a processing plant meeting Part 115 requirements
- Composted at a site that has not more than 200 cubic yards of yard clippings if no nuisance is created
- Decomposed in a controlled manner using a closed container to create and maintain anaerobic conditions (e.g. anaerobic digester)
- Disposed of at a landfill if diseased or infested or the material is an invasive plant collected through an eradication or control program and inappropriate to compost
- Facilities managing over 200 cubic yards of yard clippings must register with EGLE

Twenty-four registered composting facilities were surveyed to obtain their status in offering organic waste management services to the region. Eight facilities are municipal operations and 16 are privately owned. Most of the operations focus only on yard waste management (i.e., leaves, grass clippings and small woody waste), however two private operations accept approved food waste. Nine operations describe compost as an end-product; however, it is not known at this time if claims of compost meet the technical specifications for finished compost (biologically stable), or if the claims really describe a partial, but technically unfinished, compost. Table 1. provides a summary of the survey findings.

Table 1. Summary of Registered Compost Operations in Western Michigan

NAME	COUNTY	YEARS IN BUSINESS	MATERIALS ACCEPTED	PUBLIC ACCEPTED	END PRODUCT	FEES
Accurate Excavators	Muskegon	20	Leaves, grass clippings, top soil	Yes	Composted with top soil	Yes
Autumn Hills	Ottawa	NA	Stopped Accepting	No	Compost	Previously
Brewers Sand and Gravel	Ottawa	9	Blueberry growers organic waste	No	Mixed with top soil	Yes
City of Grand Rapids	Kent	28	Yard waste	Residents	Compost	Taxes
City of Greenville	Kent	20+	Yard waste	Residents	Leaf mulch mixed with soil	Taxes
City of Hastings	Barry	Ukn	Yard waste	Residents	Leaf mulch mixed with soil	Taxes
City of Holland	Ottawa		Yard and park waste	Residents	Unknown	Taxes
City of Ionia	Ionia	Ukn	Yard waste	Residents	Unknown	Taxes
City of Wyoming	Kent	13+	Yard waste	Residents	Leaf mulch	Taxes
Landscape Impressions	Kent	6	Yard waste	Yes	Leaf mulch mixed with top soil	Yes
Landscape Supply	Muskegon	30	Yard waste & soil	Yes	Leaf mulch mixed with top soil	Yes
Michigan Wood Fibers	Ottawa	26	Organics & top soil	Yes	Organic mulch mixed with top soil	Yes
Muskegon Charter Township	Muskegon	25	Yard waste	Residents	Leaf mulch	Taxes
Phoenix Resources	Kent	29	Yard & approved food waste	Yes	Compost	Yes
Pitch Realty	Ionia		Yard & wood waste	Yes	Unknown	Yes
Prestige Landscape Supply	Muskegon	30	Yard waste & soil	Yes	Compost	Yes
Renewed Earth	Allegan	24	Organics & soil	Yes	Compost	Yes
RMS Disposal, Inc.	Ottawa	6	Yard & wood waste	Customers	Compost	Yes
Rusche's Trucking	Kent	50	Yard waste	Yes	Compost	Yes
Top Grade Aggregates	Ottawa	30	Yard & small wood waste	Yes	Compost	Yes
Verplank Dock Company	Ottawa	112	Yard waste	No	Leaf mulch top soil	Taxes
Village of Caledonia	Kent	45	Yard waste & soil	Residents	Leaf mulch top soil	Taxes
West Shore/Republic/Cocoa	Ottawa	5	Food and organic wastes, bioplastics	Customers	Compost	Taxes or fees
White Lake Excavating	Muskegon	35	Yard & wood waste	Yes	Leaf mulch top soil	Yes

MUNICIPAL ORGANIC MANAGEMENT

Almost all the urban cities and townships in Kent County offer yard waste services to their residents paid through resident taxes or fees. The services provided at this time are exclusively for yard and woody waste generated by homeowners within their jurisdiction. Currently, no municipality accepts food waste or offers a sponsored composting service for their residents.

The City of Grand Rapids is in the planning and development stages to accept food waste at their compost facility at some point in the future. Several private companies offer organic waste services to residents and businesses in these communities for a fee. Most organic waste collection programs are drop-off sites with collection containers where residents can bring approved material. Only five of the 16 communities researched provided collection services, which is typically either loose or bagged materials left at the curbside during designated periods. Several municipalities offer leaf mulch (partially composted leaves and wood) to their residents for use. None of the municipalities offered fully processed organic material into finished compost. Table 2 provides a summary of public information available.

Table 2. Summary of Public Information on Municipal Organic Management Programs in Kent County

Municipality	Accept Yard Waste	Accepts Food Waste	Provides Collection	Leaf Mulch Available	Compost Available	Cost (Fee or Tax)
Alpine Township	✓					✓
Byron Township	✓					✓
Cascade Township	✓		✓	✓		✓
City of East Grand Rapids	✓		✓			✓
City of Grand Rapids	✓		✓	✓		✓
City of Grandville	✓		✓			✓
City of Kentwood	✓					✓
City of Sparta	✓		✓			✓
City of Walker	✓					✓
City of Wyoming	✓		✓			✓
Village of Sand Lake	✓					✓

NOTE: Information is based on voluntary responses from listed municipalities. Those not listed have no record of organic waste management services.

Estimate of Organic Materials Received By Kent County Facilities

The estimated volume of organic material disposed in DPW facilities is between 190,000 tons and 215,000 ton per year.^{14,15} In each case the estimated organic waste content ranged from 27% to 33% of the total waste received of which food waste was the largest single component of all organics at 13%.

Estimate of Potential Current Market Value of Disposed Organics

Assuming 80% of 205,000 tons per year is compostable; the average market price for finished compost is \$34.50 per cubic yard; and that a cubic yard of compost weighs approximately 1,200 pounds, the following market value would be assigned:

$205,000 \times .8 = 164,000$ tons per year $\times 2,000$ pounds per ton = 328,000,000 pounds / 1,200 pounds per cubic yard = 273,333 cubic yards \times \$34.50 per cubic yard = \$9,429,988 in potential value of organics in Kent Count DPW disposal facilities each year.

14 WMSBF waste characterization/economic value study
15 GBB WTE Study

FUTURE OPPORTUNITIES

1. Develop a strategic plan to promote county-wide best and highest use of both Class 1, 2 and food waste organics management collection and processing systems.
2. Work with Commercial Haulers and Municipalities to coordinate organics management for those interested in collaborating.
3. Collaborate with private sector stakeholders to evaluate potential for public-private partnerships.
4. Regional solutions for industrial by-products (such as composite wood and plastics) to meet zero-waste-to-landfill goals.
5. Use the Sustainable Business Park as a regional catalyst to coordinate processing capacity in the region.

The information contained in this report came from phone and/or email communication with representatives of individual businesses or from publicly available information.

Thank you to everyone who voluntarily provided information to contribute to this report.

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