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FOR IMMEDIATE RELEASE
APRIL 10, 2024

MORC RECEIVES 2023 CROWN COMMUNITIES AWARD

Facility recognized for being self-supporting while reducing harmful greenhouse gases

MUSCATINE, Iowa – American City & County has selected the Muscatine Organic Recycling Center as a recipient of the 2023 Crown Communities Award. Following is the article published by the magazine and written by Michael Keating is senior editor for American City & County.

The [Muscatine \(Iowa\) Organics Recycling Center \(MORC\)](#) has a food waste depackaging operation that can process more than 4,000 tons of packaged food waste each year. Regional food manufacturers from up to 500 miles away deliver the packaged material to the facility. The food waste creates methane, which is a greenhouse gas that harms the





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environment. MORC accepts a variety of items for efficiently converting food waste to energy and other products.

Muscatine decided to divert large amounts of food waste away from landfills and toward methane-capturing anaerobic digesters at the city's wastewater plant for renewable energy creation. MORC is self-supporting, generates some revenue, and helps reduce methane emissions from landfills. For all of these reasons, the MORC has been selected as a [2023 American City and County Crown Communities award winner](#).

Jon Koch, the director of Muscatine's Water & Resource Recovery Facility (WRRF), explains that the city has a High Strength Waste (HSW) Department that is within the WRRF. He says its output consists of liquid waste from grease traps and other industrial waste as well as the MORC solid waste from depackaging.

"The city charges \$0.10/gallon for liquid high strength waste and \$55/ton for solid depackaging services," Koch said.

The MORC charges a \$40 per-ton tipping fee for large waste drop-offs. Koch adds that once the facility begins the production and sale of biogas, there will be payback to the city's reserve fund. Total project cost for MORC was \$3 million which was financed through reserve monies from the city's Water Pollution Control Department funds.

How MORC got started

In the U.S., food waste is estimated at between 30-40 percent of the food supply. As noted in the Muscatine American City & County Crown Communities application: "This food creates methane gas and is one of the largest generators of harmful greenhouse gases. Muscatine decided to divert as much food waste away from landfills and toward methane-capturing



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anaerobic digesters at the city's wastewater plant for renewable energy creation. There were no public facilities depackaging food waste anywhere in the middle of the country, so the Muscatine Organics Recycling Center (MORC) was born."

The city acquired a T42 turbo separator from Scott Equipment (New Prague, Minn.) to help process the packaged food waste. As noted in the Crown Communities application: "The turbo separator was installed in an old recycling center that has not been used since single-sort home collection was started in 2011, effectively recycling the recycling center. It required the installation of a push wall so that residential and grocery waste can be scooped up and run through the machine as well."



Jon Koch and crew in front of the Scott T42 at the MORC

The new setup required the conversion of an unused tank at Muscatine's WRRF (which is also known as the wastewater plant) to store the liquefied food waste to be added to existing anaerobic digesters. The complete process enables the creation of nutrient-rich biosolids for fertilizer and renewable energy biogas for the boilers.

The Muscatine facility has enabled regional grocery stores to increase food waste recycling due to the depackaging capability. The stores can now do more than just compost raw vegetable waste through the plant. The process allows for meat, grease, packaged food and other items to be recycled where composting is not possible. The facility has a free drop off site for anyone in the community to use.

Let's not forget about another valuable byproduct from the food-waste process: fertilizer. After it is processed in the plant's turbo separator, food waste is taken to methane-capturing anaerobic



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digesters. The 1-million-gallon-capacity units are filled with essential bacteria and continue to break down the food waste. The leftover product is a fertilizer that is used to enrich farmland near the MORC. Nearly 6 million gallons of the fertilizer are made each year from a combination of municipal waste and the organic food waste.

Koch tells American City & County that there really needs to be more food waste depackaging systems and similar gear in local government recycling operations. He adds that the systems need to be spread out over a large area so that facilities are not fighting for feedstocks.

"I don't foresee this being a typical process for every community, but those that are motivated should certainly proceed with seeing what feedstocks are out there and finding out what priorities local residents and leaders have," Koch said.

Koch says that when he raised the topic with past Muscatine City Council members, he would ask them: "What kind of community do we want to be? Are we forward-thinking enough to realize that this is something that will enhance our community into the future and meet sustainability goals? How do we want potential businesses and industries to see us and consider relocating or expanding in Muscatine?"

Koch offers the following advice to local government officials who are thinking of setting up a food waste depackaging facility or similar operation: "You need to have a really strong and consistent feedstock. Working with large recycling companies is imperative to finding these consistent sources so start with the need in your region before planning. We receive material from as far away as 250 miles."

He explains that the amount of waste packaging has been larger than anticipated in Muscatine's facility. "So, locating process equipment at the transfer station or near the landfill will go a long



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way in keeping operations running with limited down-time. A trash compactor would be something I would add to our process if I were to do it again.”

Management at MORC is constantly looking for ways to evolve and improve, Koch says. “We may add some storage for material because it always seems you need more storage as we stage material through the process.” He also predicts the following: “The city’s HSW Department is now seeking expanded digester capacity in Phase II so that more material can be brought in, and Phase III Biogas Utilization can begin.”

Koch notes that the city continues to reach out to other public sector entities: “We did pilot a food waste recovery program at the local junior high in 2022 and hope to get a more permanent program going in the future with all community schools.”

Koch says Muscatine’s WRRF has quadrupled biogas production from simple sanitary waste since 2020. “We hope to be selling the gas in the next year or so or to be utilizing it in our own microgrid here at the WRRF. In that scenario, we would sell the electricity to realize the energy credit while protecting the WRRF from power outages and power surges.”

The MORC project has received multiple awards including: The Iowa Chapter American Public Works Association 2021 Project of the Year Award, American Academy of Environmental Engineers & Scientists 2021 Honor Award, Engineering News/Record 2021 Merit Award, American Council of Engineering Companies (ACEC) of Iowa 2021 Grand Place and Grand Conceptor Award, ACEC 2021 National Grand Award, Iowa Society of Solid Waste Operators Innovative Project Award, Solid Waste Association of North America Sustainable Materials Management National Honorable Mention Award-2023, and Water Environment Federation National Project Excellence Award-2023.



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