Talking... TRASH

The Newsletter of the SWANA Florida Sunshine Chapter Fall/Winter 2022

IMAGINE MORE
THE BRIGHTEST IDEAS IN SOLID WASTE

SWANA FL 2023
Winter Conference

February 20-22
Hilton Orlando Lake Buena Vista

NEW LOCATION!

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Additional Details

Geosyntec consultants

Support Services for Solid Waste Management in Florida

Uncertain Times. Informed Decisions.

We understand the immediate and longer-term impacts of the global COVID-19 pandemic on solid waste operations, not least in terms of looming inflationary pressure, labor shortages, and uncertainty surrounding supply chain issues, which has affected procurement of new equipment and parts and distorted recycling markets. Many services such as curbside recycling remain popular with the public, yet for the majority of our clients are economically marginal. Waste generation has changed during the pandemic, with many haulers reporting sustained increases in residential waste and recycling streams coupled with declines in commercial volumes. No matter the challenges you are facing, Geosyntec can help your solid waste operation to be more efficient and resilient for an alternate future.

What We Offer

Our experienced team of engineers, scientists, and economists can help.

Rate and Cost Analyses: Updated rate structures and cost-of-service models are needed to better understand cash flow implications. We can help with:

- Rapid rate studies, audits, and level of service analyses to rebalance rate structures and competing priorities
- Revising input costs, inflation, and volume projections based on updated benchmarks and industry data
- Grant application assistance for critical infrastructure

Engineering Design: We have pioneered the use of mechanically stabilized earth berms designs to maximize capacity expansions. We can help with:

- Vertical landfill expansions to add capacity through airspace volume while maintaining existing site footprint
- Design of landfills over challenging subgrade conditions such as soft soils and karst
- Innovative gas collection and optimization and leachate management solutions to help reduce cost and maintenance needs for owners and operators

Planning: Revised near/medium term plans under “what if” scenarios will be key to providing necessary flexibility and resilience to maintain services and budget levels through the next several fiscal cycles. We can help with:

- Contingency planning
- Alternative disposal solutions, operational, and recycling market assessments

In these times of unprecedented global uncertainty, Geosyntec offers advice on fulfilling service obligations and customer commitments while minimizing costs and risks.

ABOUT GEOSYNTEC

With 1,800 engineers, scientists, and technical personnel; we serve our clients from more than 90 offices in the United States, Canada, the United Kingdom, Ireland, Sweden, the United Arab Emirates, and Australia.

Geosyntec has one of the largest groups of solid waste professionals in Florida (20+) who can provide engineering, solid waste planning expertise, and advisory services for your project needs.

For additional solid waste advisory-related services, visit geosyntec.com/swa

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Letter from the President

December 2022

It's the most wonderful time of the year…so I hope everyone is past the post-turkey coma and back to finishing out the year strong. It's been a busy year. For the first time in a while, we successfully pulled off our two annual events, which were both well attended, our finances have weathered the storm and are heading in a positive direction, and we get to do it all again in 2023. This is always an odd time of the year as we look to wrap up projects and close out 2022 while balancing the demands of our personal lives. But there is so much to look forward to….its going to be a busy few months in the SWANA world.

This February 20-22, 2023, we host our Winter Conference in Orlando. We are finalizing the agenda so book your rooms, get registered and get ready to talk about what is driving us in the industry these days. We will have two days of interesting solid waste topics and presentations. Also, SWANA's SOAR event will be in Atlanta in April. I hope that Florida shows a strong regional representation at the premier technical event put on by the national organization.

How many of you reached out to our technical committees to express interest in helping out after our last conference? Our conference and newsletter content is supported by these committees and they are always looking for new energy and ideas to bring forth information to our membership. Reach out to the committee chairs to find out what you can do to help - About – SWANA Florida.

The holiday season is always a reminder of the great work our industry performs year round but especially this time of year. We are asked to keep services rolling regardless of holidays and school breaks. It doesn't matter what's going on in the world, the magic of the disappearing garbage can is a community expectation, and we continue to deliver. Our "invisible" infrastructure is part of the backbone of community services that keep us safe and healthy daily. I'd like to thank everyone for the work they do especially the folks on the front lines of routes, landfill active faces and MRF tipping floors and especially in response to natural disasters. The tireless work performed week in and week out is something for which we can all be proud.

Have a safe and happy holiday season and I look forward to seeing everyone in the new year and especially in February.

Cheers!

Sincerely,

Keith Howard
SWANA FL President

In This Issue

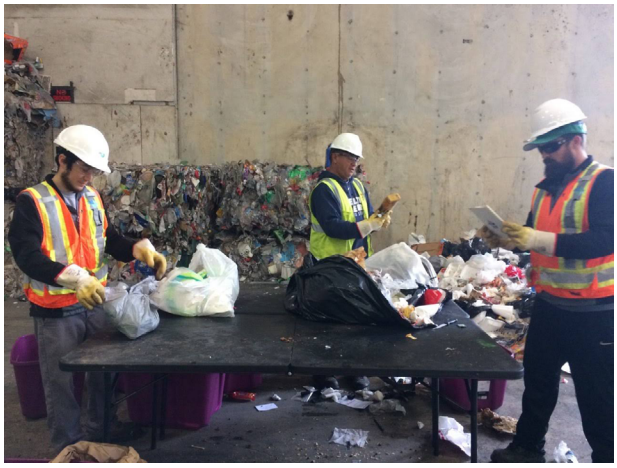
Desktop Waste Characterization Studies: Lower Cost, Fewer Hazards, Less Smell

Sarah A. Gustitus-Graham, EI, PhD, Sean T. O'Donnell, PE, PhD, Montana Meeker, Marc J. Rogoff, PhD, and Mark Jackson

What if we told you that you could gain an understanding of your waste stream composition without getting dirty? "Desktop" waste characterization studies can be done from the comfort of a computer chair with nary a whiff of garbage. These studies can also be completed at a lower cost, with fewer health and safety hazards, and in less time than traditional field-based studies. The efficacy of a desktop-based study hinges on the assumption that the composition of a waste stream is determined by human behavior and resources. By using metrics to represent similarities and differences in human behavior and resources in different areas, we can use field-derived waste compositions from various localities to predict waste composition in a target locality. Desktop waste characterization studies are particularly useful for preliminary investigations to gauge whether the implementation of a new program for waste diversion is warranted.

The Desktop Waste Characterization Process

To correlate the composition of one waste stream to another, the metrics that make each locality unique (e.g., population, median income, recycling rates) must be compared, taking their relative impact on the waste stream into consideration. Rather than choosing a single comparable locality that has the "right" mix of metrics, the waste stream compositions of multiple localities can be weighted based on their "fit" to the target area. An Analytical Hierarchy Process (AHP) methodology, as presented by Saaty (1994) can be used to subjectively rank the importance of metrics and subsequently score comparable studies using the following steps:

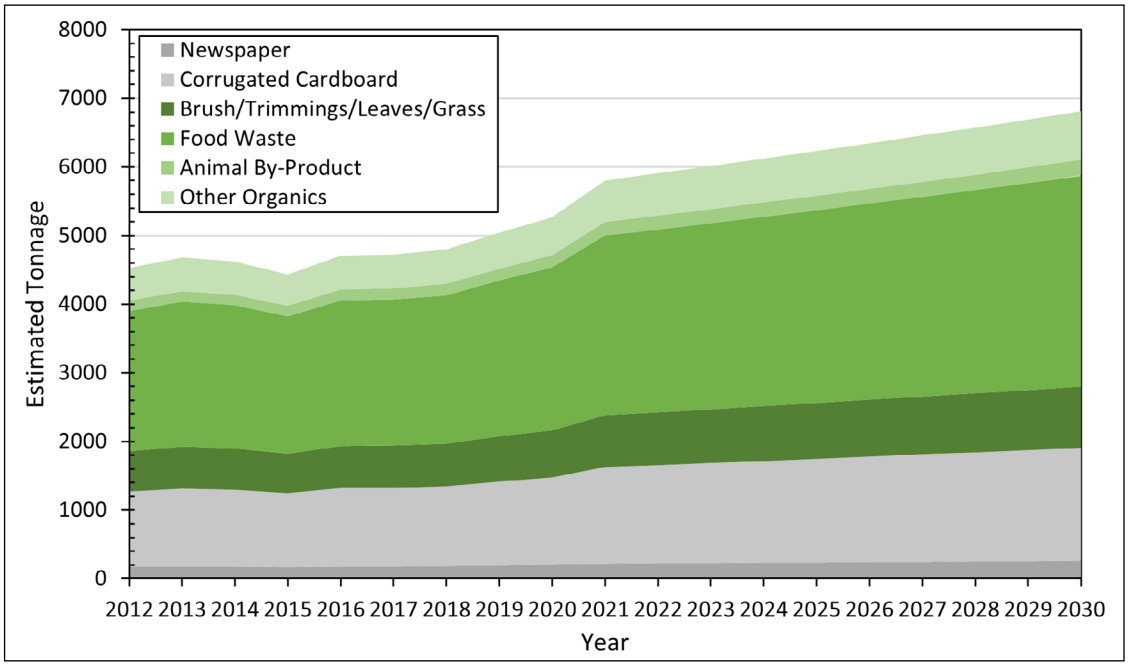


1. *Create subjective pairwise comparisons between metrics, using a scale of 1 to 9:* For example, if median income was judged to be twice as important as population, median income would receive a score of 2 and population would receive a score of 1.

2. *Use pairwise comparisons to determine a weight for each metric:* Using a matrix of all the pairwise comparisons, weights can be mathematically determined for each metric.

3. *Quantitatively assign scores to comparison studies based on how closely metrics match the target area:* For example, if the reported median income in two study jurisdictions were found to be 2% and 4% greater than the City's recycling rate, respectively, then the first study would be assigned a score of 2 and the second study would be assigned a score of 1 in the pairwise comparison. This is because the recycling rate for the first study was twice as close to the client's recycling rate as that of the second study.

4. *Generate final scores for each comparison study:* Weights for each



metric (step 2) can be multiplied by the scores for each metric (step 3), and the products can be summed to generate a final score for each comparison study.

5. *Weigh the contribution of each comparison study based on score:* The final step is take a weighted average of the waste stream components from each comparison study to generate a predicted waste stream composition for the client.

Case Study: City of Pensacola

The City of Pensacola sought to understand the quantity of organics in their waste stream as part of a preliminary feasibility analysis for waste diversion programs and technologies. Geosyntec completed a desktop waste characterization study for the City in Spring 2022 with a specific focus on the organic waste fraction. We began by benchmarking the City's defining characteristics against other regions with existing waste composition data. The comparison regions were ranked using metrics including population, median income, population density, recycling rates, tourism (represented by hotel/motel rooms per capita), and student population. The latter two metrics were selected to control for large tourism industries and high student populations.

Waste categorization differed between each of the comparison studies. Broadly encompassing categories were employed to normalize disparities between datasets. The resulting composite waste stream was modeled by assigning these individual datasets the weights determined through pairwise comparisons of metrics. The accuracy of the method was tested by using the final metrics to predict the known waste stream of a county from the comparison set. Based on this analysis, the model was found to have an average error of +/- 2% per predicted waste stream subcategory. This degree of error was deemed acceptable for the city's goal of estimating the quantity of organic waste in their disposed waste stream.

The waste component proportions were applied to actual and projected MSW tonnages for the city to estimate the total projected tonnage of each component category. An estimated 5,803 tons of compostable materials were estimated to be present in Pensacola's waste stream in 2021, with the potential to increase to 6,814 tons by 2030. Actual capture rates will depend on the programming and infrastructure implemented by the city.

Considerations for Desktop Characterizations

The desktop waste characterization study was a useful tool for Pensacola's preliminary feasibility study, offering valuable information while conserving budget. To make the most of a desktop waste characterization, the following should be considered:

• Comparison studies should be carefully selected for similarity to the target area. A comparison study with excessively disparate qualities can skew the results, even when a low weight is applied using the AHP approach.

• Desktop waste characterizations are most useful for preliminary investigations where error tolerance is higher or the category of interest in broad. Comparison studies often use different categorizations which may obscure the proportions of specific materials (e.g., HDPE may be grouped with a larger "plastic containers" group).

• Local knowledge of both the target waste shed and comparison waste sheds facilitate accurate comparisons.

For the case of Pensacola, the desktop waste characterization offered valuable insight into the upper limit of compostable waste that could be diverted from landfilling—and all without touching a single rotten banana!

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Reference

Saaty, T.L. (1994) Fundamentals of Decision Making and Priority Theory with the Analytic Hierarchy Process. Pittsburgh: RWS, ISBN 0-9620317-6-3.

Photos courtesy of Marc Rogoff and Montana Meeker.

Using GIS for Solid Waste Projects is a Game-Changer

Kayla Ouellette and Juliette Gutierrez

Today, mobile applications for accessing data have significantly advanced how we work in many industries, including architecture, engineering, and construction. Many use Geographic Information Systems (GIS) to capture, store, and display data on a map. Employing GIS in solid waste engineering allows greater access to more accurate data, which helps to efficiently meet compliance goals.

In many county or city solid waste departments, GIS has not been adopted despite other departments using GIS to help monitor their assets (utilities and water departments for example). Experience proves that applying GIS technology to solid waste activities helps to better identify, track, and solve issues.

The top reasons to use GIS include:

1. *Real-time data visualization and updates*: Project managers see data instantly to make fast and better-informed decisions.

2. *Enhanced data quality*: Data is entered directly online with optional validations for real-time quality control. No manual data transfers decrease the potential for human error.

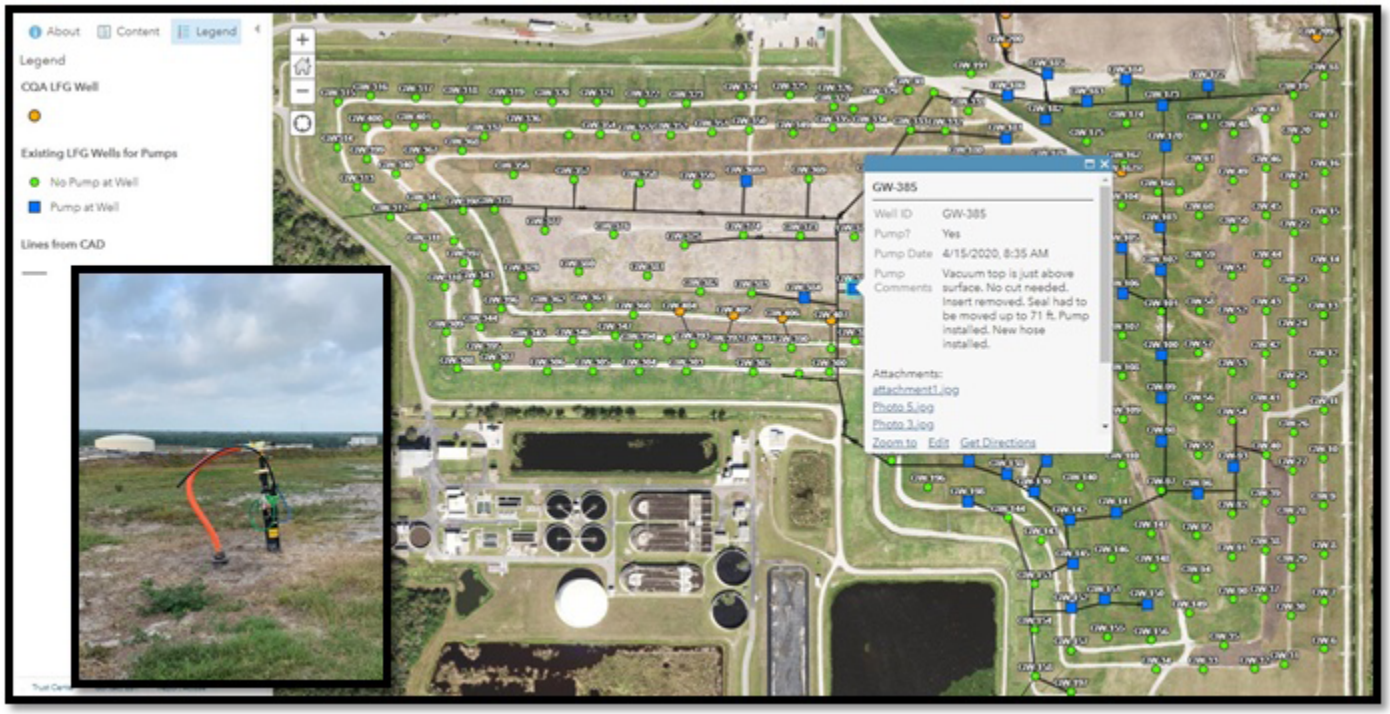
3. *All-in-one storage*: Record keeping is simplified with photos, field logs, past event results, and plans all in one place. Centralized, online storage eliminates issues with employee turnover or individuals incorrectly storing data.

4. *Efficiency and time-savings*: Field data can be easily exported for inclusion in spreadsheets or reports. Maps allow for spatial analysis which provide insight into patterns and causation.

For solid waste, sampling is regulated and critical to meeting landfill compliance goals. Landfills could have hundreds of wells onsite. Collecting data from each well can be complicated considering sampling locations, dates, multiple sample parameters, photos, etc. With GIS, not only can data be stored in one place with spatial context, but it can also quickly be analyzed to visualize trends over time and reveal how the landfill is functioning.

For those interested in using GIS, the following steps can help make that transition successful:

1. Find out if your organization is already using a GIS platform that your team could access with minimal to no additional software costs.



2. Introduce your teams to the proper people within the GIS department. Offer to take them to a project site so they can understand the work you do and how you do it.

3. Identify and clearly define the goal of a task and work backwards to create deliverables and workflows.

4. Consider the objectives of different users and design the deliverables to suit their needs. For instance, someone in the field needs access to different information and likely needs to visualize it differently than a program or site manager.

5. Talk to a neighboring city, county, or private entity about their GIS workflows. Ask what worked and what did not.

Invite your GIS person, team, or subconsultant on a site visit. Make sure they understand data collection and any other tools the team uses. If the GIS platform is not designed to support the way your landfill team works, field staff and others may not use it. But, if a true connection between the departments occurs, the long-term benefits and advantages will be considerable.

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Keeping it Simple: An Alternative Approach to Site Life

Kollan Spradlin, PE, CHMM and Fauve Herron, EIT

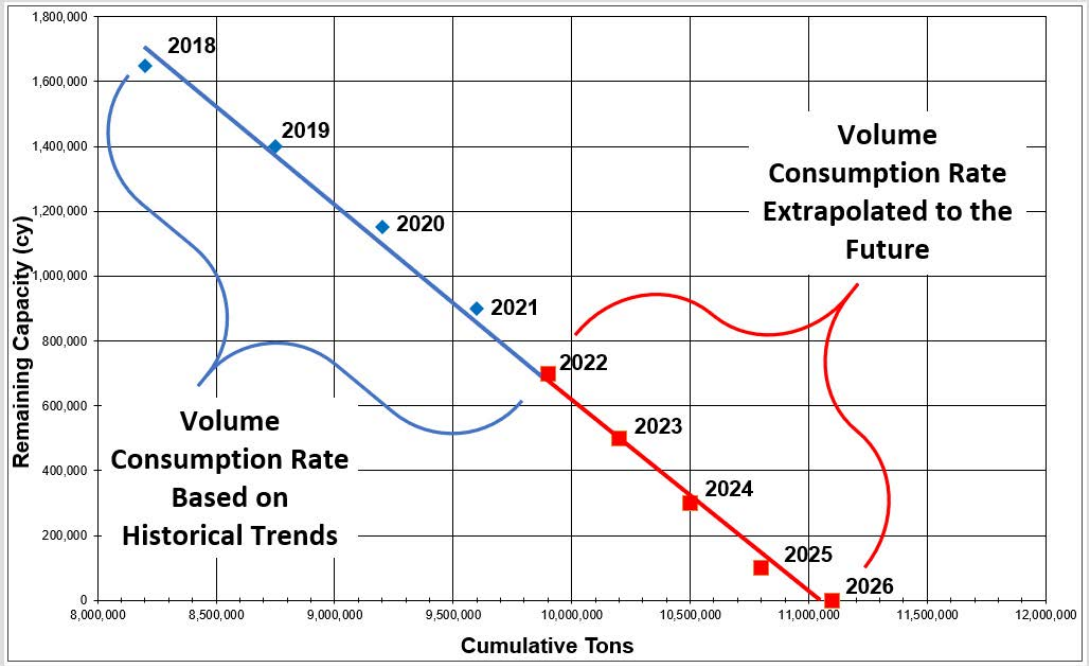
It is easy to continue to do things as they have always been done, and site life reporting for a landfill is no exception. Traditionally, site life calculations have been highly dependent on population growth projections and per-capita disposal rates. However, as experienced since the onset of the COVID-19 pandemic, even optimistic projection rates can underestimate regional growth.

Sometimes the use of predetermined growth rates and changes in disposal trends result in unanticipated loss of site life. However, identifying an accelerated volume consumption trend is often delayed due to the need for multiple data points over several years. Once identified, what kind of adjustments can be made to the model to address these issues?

Of course, we could adjust population growth rate, the per capita disposal rate, or the assumed density of future waste, but it will still take a number of years to gauge how those changes affect the year-to-year site life. Instead, we can return to the historic data that encompasses the emerging trend and frame the problem differently. *How can we simplify the calculation to reduce the number of assumed variables?*

The foundation of site-life calculations is rooted in volume consumption rates, not necessarily population growth, economic environment, or service area industry. We want to predict when the remaining volume will run out. The Remaining Capacity Method (RCM)[1] does just that.

RCM uses previous volume and tonnage data to develop a graphical relationship between remaining airspace and tons of waste in place.



RCM graph showing volume consumption trending toward zero cubic yards remaining.

A linear volume consumption trend is plotted through data points that is extrapolated to a future date at which zero volume remains. This method can be adjusted to fit the professional's judgement by altering the future waste in place density or the annualized tonnage increases. Unlike traditional calculation methods, RCM ignores population projections and per-capita disposal rates.

Since implementing RCM for a number of our clients, we have observed that the predicted closure year remains more consistent during the annual reporting period. This allows clients to develop more accurate financial and systemic plans while providing a more reliable basis of financial assurance for regulatory requirements.

There are a number of ways to estimate the remaining life of a landfill, many of which rely on population projections to predict future disposal. While those methods remain valid, you may find that previous site life iterations have been less accurate than you had hoped as you are able to observe trends over consecutive years. The RCM presents an alternative way to combine unknown variables into the most influential factor—the rate at which we deplete the remining volume—and uses that rate to estimate a date for when that will occur.

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Note

1. Developed by SCS founder Bob Stearns.

CONGRATULATIONS!

Congratulations to the following individuals for placing at the SWANA International Road-E-O in El Paso, Texas, in October!

Alexander Grant
City of Clearwater
1st place, Roll Off

Joseph Marshall
City of Clearwater
3rd place, Tractor Trailer

Evangelos Chatziemmanoui
City of Largo
3rd place, Truck Mechanic

Advertising Opportunities Available

It's not too late to reserve a space in the Spring issue of Talking Trash.

Job Openings

Post an employment notice on the SWANA FL website and in the YP newsletter for FREE!

Email info@swanafl.org or visit www.swanafl.org for more information.

Turning Trash into Treasure: Organics Management for Landfill Operations

Trent Arney, EIT

Let's start this with everyone's favorite topic—new regulations, especially those that disturb the way things have always been done. Many states and municipalities have enacted organic diversion legislation in some form, which prevents organic-based waste from entering landfills. This type of legislation can pose quite an operational challenge for landfill managers, as well as remove waste streams that would have otherwise generated revenue. There has been a major public push towards more sustainable lifestyles in the past few years, which could lead to organic diversions spreading throughout the country. It is therefore advantageous that landfill operators begin to explore the composting process before these diversions make their way to their state to prepare and understand the composting processes that work for their site.

Hillsborough County Landfill Biosolids Composting Facility saves the county an estimated $500,000 per year.

Popular Methods

Turned Windrows

By far the most commonly used method in the composting industry, and for good reason: it is relatively simple, effective, and can be operated with minimal equipment. The biological process relies primarily on passive aeration but turning is required to promote aeration and mix the windrows. This is usually accomplished by using a compost turner (a specialized piece of equipment) but can be operated with something as basic as a front-end loader (though this will take more time and space). On the other hand, the windrows take up almost double the space as other methods and take longer to produce a mature product.

Aerated Static Pile

A popular choice for food waste composting with a significantly smaller footprint than other methods. It involves a system of perforated pipes sitting underneath the windrows, which provides the composting material with a constant supply of aeration, removing the need to periodically turn the piles. The increased oxygen raises the temperature and speed of the biological process, which decreases the time required to a complete product. This process requires a larger capital expense up front to build the aeration system.

In-Vessel Composting

This method provides an alternative solution for sites that do not have the space or infrastructure to properly use the other popular methods. The composting process takes place in a drum or box, where the aeration and mixing occur using rotation or an auger. The footprint of this process is significantly smaller than other methods and does not require heavy or specialized equipment.

Potential Benefits

Financial, public image, regulatory, and even disposal of more challenging waste streams are just a few of the potential benefits of a composting operation. The product that you generate can be sold to support local agriculture, generating revenue and supporting local businesses. Material reuse can be marketed as an environmentally friendly way to remove organic waste.

Trent Arney, EIT, is a Staff Professional at SCS Engineers. He can be reached at (813) 804-6704 or e-mail TArney@scsengineers.com

Sponsorship Opportunities

We invite you to become a sponsor of the SWANA FL 2023 Winter Conference. As a conference sponsor, your organization will be recognized as a valued supporter. All general and exclusive sponsors will receive recognition as follows:

* In pre-conference promotional emails
* On the SWANA FL website
* On conference signage and in program
* On screen prior to the conference general sessions and during all breaks

By actively supporting this event, your organization will benefit by strengthening its prominence as a leader in the solid waste industry and by increasing your network of contacts and established partners within SWANA. Registration deadline for sponsors to be included in participant materials and on signage is January 27, 2023.

GENERAL

☐ Platinum Sponsor - $2,500
☐ Gold Sponsor - $2,000
☐ Silver Sponsor - $1,500
☐ Bronze Sponsor - $1000

EXCLUSIVE *(available on a first-come, first-served basis)*

☐ Monday Welcome Reception - $4,000 - includes sole recognition at the reception, table signage and one full-conference registration
☐ Tuesday Lunch - $5,000 - includes sole recognition at lunch, table signage, one full-conference registration and half-page ad in conference agenda
☐ Wednesday Lunch - $5,000 - includes sole recognition at lunch, table signage, one full-conference registration and half-page ad in conference agenda
☐ Conference Bags - $1,500 **plus** the cost of selected bag - includes logo on bags that will be distributed to all attendees
☐ Name Badge Lanyards - $1,500 **plus** the cost of selected lanyard - includes logo on lanyards that will be distributed to all attendees

Have other sponsorship ideas? Contact us at 727-940-2393 or info@swanafl.org and let us know.

To become a sponsor, register online at
https://cvent.me/e8gEGz.

Member News

SWANA Caribbean-PR Chapter News

Puerto Rico's solid waste industry is undergoing one of its most pivotal moments in recent decades: the intersection of funding availability and public politics aimed at improving the solid waste infrastructure on the island. In that spirit, the Environmental Protection Agency (EPA) Region 2 Director (Lisa García) and the Department of Natural and Environmental Resources of Puerto Rico (DNER) called for a dialogue among multiple organizations, entities and individuals that work on topics that relate to solid waste management, landfills, recycling, and circular economy. The goal was to have an open dialogue where the federal and local agencies could get first-hand recommendations on how to address relevant issues and needs that the solid waste industry faces in the archipielago. These recommendations would be used to inform the planning process that both agencies are working through as future development projects are defined and funding is allocated.

The SWANA Caribbean-PR Chapter was invited to join this event, and we were present with Eng. Hanna Rodríguez and Eng. Naret Treviño, who represented our chapter and joined the conversation. They contributed to the dialogue in the wide variety of topics that were discussed, such as preventing organic materials from reaching landfills and providing stimulus to the integrated waste management industry to allow for the development of a circular economy, amongst many other topics.

As a fun fact, it shall be noted that the meeting was held at the refurbished Recycling Museum in Hatillo, PR, an idea made reality by "Reciclaje del Norte" (https://www.museodelreciclaje.com/). We encourage everyone to visit this museum while in PR to learn about the recycling efforts that are taking place on the island.

To wrap-up a successful week after having participated in the dialogue, our chapter was represented in the 2022 International Coastal Cleanup Event, led by the president of the Student Chapter of the Environmental Engineers Institute (IIAM, in Spanish) of the Polytechnic University of PR, Abdiel Garratón. About 348 pounds of solid waste were recovered from the beach by the group of volunteers in a timeframe of two hours. Year after year, our chapter continues to promote this event with the goal of encouraging future young professionals to be part of the solid waste industry and part of the solution we all need as we continue to improve how we manage waste.

Miami-Dade First Solid Waste Agency to Power EV Collection Trucks with WTE

Frank Calderon

The Miami-Dade County Department of Solid Waste Management (DSWM) recently introduced its first-ever electric-powered waste collection vehicle. The new truck has become a bit of a local celebrity in Miami-Dade County, making the rounds as local and even federal officials have stopped to pose for photos with it.

"Our new electric truck is like the first 'baby,' everyone loves it," said DSWM Director Mike Fernandez. "But my future vision is to have a whole 'family,' or fleet, of these electric waste collection vehicles,

Miami-Dade's new electric waste collection vehicle. Emissions stacks from Miami-Dade's Resources Recovery Facility—the waste-to-energy plant where the new truck will be recharged nightly—are visible in the background.

all of them powered at our waste-to-energy facility each night with the waste they collect during the day."

The new truck will be recharged at DSWM's Resources Recovery Facility, its waste-to-energy plant, possibly making DSWM the first solid waste agency in the nation to do so, said Fernandez. "This will be the first automated side loader waste collection vehicle in the U.S. that will be powered by the very waste it collects. This will be a full-circle process."

The electric waste collection vehicle, manufactured by Mack Trucks, features dual electric motors that produce 448 continuous horsepower and 4,051 lb.-ft. of peak torque from zero RPM. Four Nickel Manganese Cobalt Oxide (NMC) lithium-ion batteries provide power, which is recovered while driving via the vehicle's two-stage regenerative braking system.

The total vehicle cost is $688,619, including $39,465 for the charging system and a 60 month/250,000-mile service agreement for $33,000. Routine maintenance will occur yearly rather than quarterly, as is customary with vehicles powered by fossil fuels.

At current fuel pricing levels, DSWM should see a return on investment by year five (year six if fuel prices decrease). The truck has a useful life of seven to eight years. The immediate environmental benefits include the vehicle's zero emissions and reduced noise when compared with the noise produced by diesel engines.

"We are closely monitoring electric vehicles, and we plan to purchase more," said Danny Diaz, Director of Fleet Management for the Miami-Dade County Department of Solid Waste. "Especially when you factor in the savings on fuel and maintenance."

Frank Calderon is a Communications Manager with the Miami-Dade County Department of Solid Waste Management. He can be reached at (305) 514-6034 or e-mail fcald@miamidade.gov.

Marty Walsh, U.S. Secretary of Labor, sits in the cab of Miami-Dade's new electric waste collection vehicle.

DSWM Director Mike Fernandez prepares for an interview on the County's first-ever electric-powered waste collection vehicle.

Miami-Dade County Department of Solid Waste Management employees pose with Miami-Dade's new electric waste collection vehicle. From left to right are: Daniel Diaz, Acting Assistant Director, Administration; Stanley Mack, Waste Truck Driver and driver of the new electric-powered waste collection truck; and Alvin Herring, Jr., Waste Supervisor 2.

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Upcoming SWANA FL Chapter Events

2023 Winter Conference
February 20-22
Lake Buena Vista, FL

2023 Road-E-O
April 28-29
Tampa, FL

2023 Summer Conference
July 23-25
Daytona Beach, FL

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