

The Newsletter of the SWANA Florida Sunshine Chapter

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Letter from the President

December 2019

I hope everyone is having a wonderful holiday season. The holidays are a great time to take some time, reflect and reconnect with family and friends. I'd like to say it's a good time to recharge batteries but as you all know this is one of the busiest times of the year in the solid waste and recycling industry. As the Black Friday/Small Business Saturday/Small Brewery Sunday (yep it's a thing)/ Cyber Monday events show, consumption of goods



has not slowed. With more consumption comes more leftovers. As with the continued "Amazon-izing" of society, we have seen the waste stream change and our services and infrastructure need to also change.

So what can we do to re-charge? Well, go to the SWANA/RFT joint symposium and reconnect with your peers, take in some great content and find out what everyone is talking about for 2020 and beyond. The symposium is scheduled for January 26-28 at the Wyndham Lake Buena Vista. Information on registration and the schedule of events can be found at

www.swanafl.org/events/2020-swana-fl-rft-joint-summit.

The Conference Planning Committee has done another outstanding job of securing presentations that are interesting and timely. Monday afternoon is dedicated to talking about leachate and includes the results of research performed by the University of Miami. Leachate has always been a problematic operating cost and can vary from community to community depending on disposal options. Enter per- and polyfluoroalkyl substantances (PFAS), which has gained renewed attention, and the conversation gets a little more interesting. Thanks to Jason Timmons and Rebecca Rodriguez for their efforts in bringing this agenda together.

Florida has been a hotbed for recent success and although many of you are already aware, it bears repeating. Congratulations to: FAU, 1st Place student design competition at WasteCon and Shauwn Clark and Carl Ballard for their 1st Place performances at the National Road-E-O.

Finally, I have asked all of the technical committees to step up and help add to the value of SWANA membership. If you are interested in participating or leading one of our technical committees, please reach out to me.

Cheers to 2019, we're done and ready to improve on the good and bad events and here's looking forward to a prosperous 2020. Happy New Year!

Sincerely,

Keith Howard SWANA FL Chapter President

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Potential Dangers of PFAS Chemicals in Waste Products

Ramon Rivera

Levels of chemicals and other pollutants in drinking water are monitored to ensure they do not pose a health risk to humans. Now health regulators warn that food can also be a source of exposure to toxic chemicals, with emerging contaminants such as PFAS chemicals showing up in agricultural produce destined for our tables.

A group of chemicals collectively referred to as polyfluoroalky and perfluoroalkyl substances (PFAS) have recently raised concerns regarding their impact on the environment and on human health. PFAS is used in products such as non-stick coatings (teflon) and firefighting foam, the latter being particularly problematic as it is has been used for firefighter training on military and airforce bases for decades, resulting in legacy contamination of freshwater sources across the U.S.

There are hundreds of different PFAS chemicals on the market. According to the Agency for Toxic Substances and Disease Registry, studies on some of these chemicals have indicated that they can negatively affect growth and development, as well as learning and behavior in children; cause hormonal imbalances and infertility in adults; as well as promote high cholesterol levels, compromise the immune system and increase the risk of cancer. Yet, despite these dangers, very little is known regarding the toxicity of many of the PFAS chemicals, or to what extent they are found in the environment, water sources and our food supply, or for that matter our bodies.

Recent surveys have revealed that drinking water supplies that serve 6

million Americans contain PFAS at levels exceeding the safety standard set by the U.S. Environmental Protection Agency (EPA). The majority of this contamination stems from more than 400 U.S. military bases that are either known to have



Featured Image Credit: U.S. Air Force photo/ Eddie Green.

released PFAS in firefighting foams or could have potentially released PFAS during firefighting training exercises. More than 100 Superfund sites have tested positive for PFAS chemicals.

However, a recent report in *Bloomberg Environment* indicates that the problem is not only limited to military bases or drinking water, but is likely to be far more widespread, affecting agriculture and the food we eat too as well as the farmers that put their heart, soul and life into producing that food.

Because the industrial use of PFAS chemicals is so widespread, they are released into the air via factory chimneys and into waterways located nearby. They are sent to landfills or are composted, they are present in household dust, and can get washed off surfaces or flushed into drains, finally ending up in wastewater sludge, known as biosolids. Farmers spread these biosolids onto their farmlands as a cost-effective natural fertilizer, unaware of the potential danger posed by PFAS contamination. These chemicals contaminate the soil, are taken up by plants and then get into livestock that

eat them, ultimately, ending up in milk as well as in the vegetables and meat on our plate before entering out bodies when we consume them.

According to Rolf Halden, a professor at Arizona State University who co-authored a 2013 report on PFAS contamination of biosolids from the 2001 EPA National Sewage Sludge Survey, "the amount of PFAS detected in samples of US biosolids from 2001 was enough to make approximately 11 million Olympic-sized pools of water

exceed the EPA's health advisory limit." To put that in perspective, that's twice as much contamination needed to render all the water currently in Lake Powell non-potable, Halden said.

Once PFAS chemicals reach the environment, they do not break down readily. Bacteria, enzymes and sunlight that normally break chemicals down in the environment, can only convert them into other forms of themselves. Consequently, they tend to persist in the environment for a very long time. It would seem that the only way to prevent widespread contamination of our vital water and food supplies is to stop releasing these chemicals at the source—even if this means outlawing their use completely.

Ramon (Ray) Rivera is CEO of Diamond Scientific (Cocoa, FL). He can be reached at (321) 223-7500 or e-mail info@diamondsci.com.

Crouching Dumper, Hidden Camera

Michael Fernandez, Miami-Dade County Department of Solid Waste Management

Olga Espinosa-Anderson, Assistant Director, Waste Disposal Operations for the Miami-Dade County Department of Solid Waste Management (DSWM), is responsible for—among other things—overseeing enforcement of illegal dumping and the solid waste codes for the sprawling urban county, Florida's most populous.

And she will happily tell you how challenging it is to catch illegal dumpers in the act. "We're responsible for a service area of about 320 square miles and it's spread out quite a bit," Espinosa-Anderson said. "And we've been 'blessed' with some pretty creative illegal dumpers."

At her right hand is Luis Vargas, Director of the DSWM's 47-strong Enforcement Division. "The good news is we have a number of tools at our disposal, to catch illegal dumpers in the act," Vargas said.

One tool that has been getting a lot of attention—and use—recently are hidden cameras. "We place them at many of our known 'hotspots,' or areas where a great deal of illegal dumping takes place, and have caught many alleged illegal dumpers, their faces, and auto tags on video," Vargas said.

"We have been able to catch, fine and in some cases, even prosecute alleged illegal dumpers through the diligence of our outstanding Waste Enforcement Officers (WEO) and the help of our hidden cameras," said DSWM Director Michael Fernandez. "The videos also make a great outreach tool."



An alleged illegal dumper approaches a known illegal dumping "hotspot."



The alleged illegal dumper leaves the site after leaving behind unwanted waste items.

The DSWM has made some of the video footage from its illegal dumping hidden cameras available to local news media. The videos are popular with the local media, which often incorporate them into news stories reminding residents of the pitfalls of dumping waste where they should not.

The video campaign is part of the DSWM's larger illegal dumping campaign, "Dirty Crimes Carry Fines," which reminds would-be violators that the offense is not just a civil one in Miami-Dade County, but a criminal one as well. "Fines for illegal dumping in Miami-Dade start at \$250 but you could potentially be arrested by police and go to jail as well,"

said Fernandez. "Our goal is to discourage illegal dumping and encourage proper disposal of all waste materials."

"We all want to live in nice, clean neighborhoods without waste on the streets, and we know our residents want that too," Espinosa-Anderson said. "We hope anyone thinking about dumping illegally in Miami-Dade County remembers that if it's not okay to do it in their neighborhood, it shouldn't be okay to do it in anyone else's neighborhood."

Michael Fernandez is Director of the Miami-Dade County Department of Solid Waste Management. He can be reached at (305) 514-6626 or e-mail mfern@miamidade.gov.

To learn more about the DSWM's illegal dumping program, visit miamidade.gov/illegaldumping.

To watch a recent hidden camera video of an alleged illegal dumping violation in Miami-Dade C County, Florida, visit bit.ly/illegaldumpvid.

The Real Cost of Terraces on Landfill Slopes

Ali Khatami, Ph.D., P.E., SCS Engineers

Many landfill designers continue to incorporate terraces on the outside slopes of landfills, but not always for sound reasons. Sometimes, terraces are necessary to maintain landfill slopes in stable condition, due to low shear strength of the foundation

soils, or when required according to the specific state or local solid waste rules.

Some designers continue to propose terraces on slopes to collect and convey surface water runoff from a landfill's higher slopes to a low point on the terrace where the downchute system is located. On paper, it is very easy to show nicely sloping terraces toward a low point, with transverse slopes toward the landfill slope, to control surface water. However, terraces cause significant operational issues for landfill operators. Some of these problems are very apparent, and some are realized when a portion of the landfill slope is scheduled to receive a permanent final cover. Consider these factors during permitting and design.

1. It is difficult to shape sloping terraces during waste placement operations; terraces can end up formed horizontally. When it is time to close the landfill's side slope, significant amounts of soil are placed along the terrace to make it slope toward a low point where the downchute system is located. Normally, permit drawings do not include sufficient details to illustrate these technical issues, and the operator would not have the specific knowledge of such issues at the time of closing the slope.

2. During waste placement, difficulties arise for the equipment

operator (dozer pushing waste and compactor compacting and shaping surfaces) to shape the breaklines and compress waste properly to form the terrace. Lack of compaction near the outside breakline of the terrace makes it susceptible to excessive settlement and can cause the terrace to change shape over time.

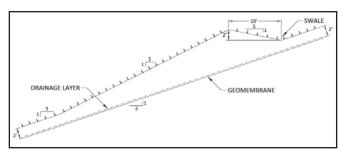


Diagram 1 - Tack-on berm and swale on landfill slope.



Photo 1 - Grading of tack-on berm and swale during construction.

3. Operators shape the transverse slope of the terrace either horizontally or sloping away from the landfill slope to manage surface water during the landfill's operational phase. In either case the slopes could end up formed differently, or in opposite direction of the slopes in the permit drawings. Closure of the landfill slope requires special attention along with large quantities of soil to shape the terrace similar to what is in the permit drawings. Again, the landfill operator would not have knowledge of the additional work and the soil quantities necessary to fix the terrace transverse slope properly.

4. Settlement in waste causes previously shaped terraces, at a certain elevation, ending up lower than the originally shaped terraces. Over time, the terrace originally constructed at a certain elevation and in accordance with the permit documents, ends up lower in elevation due to waste settlement. Continuously occurring

> settlement can cause the misalignment of terraces formed at different intervals. At the time of closing, the terrace misalignments become a major problem for the engineer and contractor to meet elevations and shapes previously permitted. 5. Downchute pipes extend from the highest terrace to the lowest terrace, and to the surface water management system at the perimeter of the landfill. The downchute pipes are designed to cross the width of each terrace and pickup surface water from each terrace. However, the pipe alignments, complicated by the terrace transverse slopes toward the landfill slope, cause construction complications and increase the risk of failing to properly collect surface waters at the low point. This particular risk can become drastic when considering waste settlement changes the surface geometry

at the inlets to the downchute system, causing costly repairs.

6. Over the terrace surface, the geocomposite drainage layer in the final cover follows the transverse slope toward the landfill slope and across the width of the terrace. Water in the geocomposite from the higher slope and from the terrace reach the inside edge of the terrace, with nowhere to go except to follow the longitudinal slope of the terrace along the interior edge. Geocomposite is not designed to carry such a large quantity of water along the interior edge for the entire length of the terrace. Inevitably, problems arise, and potential failures

can occur. The solution is to install a toe drain along the interior edge of the terrace that collects and conveys water in the geocomposite layer to the low point in the terrace. This toe drain adds another complication to the design of piping system at the low point of the terrace, where the down chute system is located. Additionally, the cost of the toe drain construction goes up significantly due to logistical complications along the terrace in the middle of the slope, including the placement of gravel around the toe drainpipe before the geomembrane and geocomposite are covered with the overlying soil. 7. The access road to the top of the landfill normally crosses several terraces located on the landfill slope. The slope surface geometry at the intersection of the access road with the terraces becomes complicated, affecting the alignment of the access road at each intersection point. 8. Leachate seeps can potentially appear at breaklines on landfill slopes. The inside

on landfill slopes. The inside edges of a terrace are considered a breakline in the landfill slope and are highly susceptible to leachate seeps appearing on the surface. Unfortunately, leachate ponding from the seeps can easily mix with surface water runoff on the terrace. It is then carried to the landfill perimeter surface water management ditches and detention/detention areas.

9. Significant leachate seeps at terraces may require a leachate toe drain system below the final cover geomembrane along the entire length of the terrace. This adds cost and another level of complication at the low point of the terrace where the downchute system is located. The leachate in the toe drain system needs to drain to another system at the low point of the terrace in order to discharge to the landfill leachate collection system.



Photo 2 - Tack-on berms and swales on landfill final cover.



Photo 3 - Discharge points of downchute pipes.

To simplify operations, more landfills are designed without terraces on the slope. Before slope closure, management of the surface water runoff is achieved by temporary tackon berms on the slope (see Diagram 1, Photos 1 and 2) and temporary downchute pipes (see Photo 3) that are easily constructed and maintained. After closure, the surface water management is achieved by permanent tack-on berms at certain spacing on the slope. The swale on the upper side of the tack-on berm conveys surface water runoff from the higher slopes to the low point of the swale on the slope.

The downchute system at the low point of the tack-on berms is simple to construct. These downchutes connect to lateral pipes from lower level swales collecting surface water from these swales before discharging to the perimeter surface water management system. The aforementioned design does not require significant maintenance.

Maximizing Airspace

Terraces decrease potential airspace within the permitted footprint of the landfill. Wasted airspace on landfill slopes is substantial and can be in the order of tens of millions of dollars depending on the size of the landfill. Owners/Operators request airspace loss calculations to emphasize the financial impact of terraces to their bottom line.

One recent evaluation for a 170-acre, 250-ft tall landfill with seven terraces lost approximately 7,500,000 cubic yards of air space. The tipping fee of \$80 per ton results in an estimated value of \$64 per cubic yard of compacted waste. Therefore, the estimate value of the airspace loss due to the terraces at this landfill site is estimated to be \$480,000,000—nearly half-a-

billion dollars of the bottom line.

This author, with more than 30 years of landfill design and construction for municipalities and private firms, has witnessed the high level of satisfaction and cost-effectiveness of no-terrace systems by landfill operators. Many of whom changed their permits to eliminate terraces to take advantage of the airspace and operational benefits.

Ali Khatami, Ph.D., P.E. is Vice President of SCS Engineers and a National Expert for Landfill Design and Construction Quality Assurance. He can be reached at akhatami@scsengineers.com.

Reflections of a Retired Solid Waste Professional

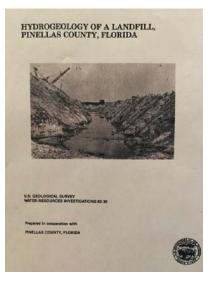
Periodic recounting of events and happenings—some humorous, some not—during the 30+ year career of Warren Smith, SWANA Florida member since 1980.

A Brief (and Necessarily Incomplete) History of Pinellas County's Bridgeway Acres Landfill

Pinellas County's Solid Waste Department is in the final stages of adopting a 30-year Solid Waste Master Plan. I am very fortunate to be part of the HDR Team that is assisting the Department's staff in performing this work. And, while I have referred briefly to this topic in a past article ("A Story of Two Different Landfills – Capacities"; SWANA-FL "Talking Trash", Winter 2018), it occurred to me at a recent Master Plan Public Meeting, that the topic and importance of Pinellas County's landfill capacity warranted a more detailed discussion.

Prior to Pinellas County's

establishment of its solid waste system in 1980 (Laws of Florida, Chapter 80-589), solid waste disposal was provided by Pinellas County Public Works by a private waste collection company, Wells Brothers, Inc.; by the privately owned and operated Windisch Landfill; and by the county's larger municipalities (for example, the now closed Toytown Landfill was operated by the city of St. Petersburg). At that time (1960s and 1970s), it was standard procedure to construct landfills using the "trench-fill" method. The regulations then merely required that disposal of solid waste not be in groundwater, or later, that the top of the groundwater table be a minimum of five feet below the base of fill. Not until the State of Florida adopted comprehensive landfill/ recycling regulations in the mid-



Landfill disposal cell construction (trench type) at the Pinellas County Landfill (circa 1980); cover photo from "U. S. Geological Survey, Water-Resources Investigation Report 82-30, Hydrogeology of a Landfill, Pinellas County, Florida"; March 1983, by Mario Fernandez, Jr.

1980s, were landfill cell bottom liners and leachate collection and treatment controls mandated.

A 1983 U.S. Geological Survey Publication (Water-Resources Investigation Report 82-30, "Hydrogeology of a Landfill, Pinellas County, Florida"), by Mario Fernandez, Jr., describes the early operation of the Bridgeway Acres Landfill and an adjacent privately operated landfill: "Solid waste from municipal collection systems and private collectors is deposited Monday through Saturday. The solid waste is buried in V-shaped trenches excavated to a depth 25 to 30 feet through surficial sand and into marl. The individual trenches must be dewatered during the filling operation due to the high water table." (p. 1)

The U.S.G.S. Report 82-30 further describes the trench construction in more detail: "The solid waste is buried in V-shaped trenches ranging from 100 to 200 feet in width, 500 to 1,000 feet in length, and 25 to 30 feet in depth, dug into sand and marl. The depth of the excavation is controlled by the plasticity of the sand and marl. The trenches are excavated with a dragline and the overburden is deposited next to the trenches ... After the trenches are filled, landfill operations shift to the area method of disposal in which solid waste is deposited to heights of about 25 feet above land surface." (p. 5)

The "marl" referred to is known geologically as the Hawthorn Formation, and serves as the horizontal confining layer, into which the landfill's artificial vertical confining layer (slurry wall) has been constructed, thereby preventing leachate generated from reaching the Floridan Aquifer. This "liner system" used at the Bridgeway Acres Landfill, as well as at several other municipal landfills in Florida, serves as an acceptable substitute to the more typical geosynthetic liner systems employed by most new landfills.

When I arrived on the scene in late 1999 as Pinellas County's new Solid Waste Director, landfill cell construction was still being performed as described by Mario Fernandez, Jr. in his U.S.G.S. report. I was told the landfill private contractor was preparing a new disposal cell, and they wanted me to take a look. Indeed, what I saw was a trench about 200 feet long, 100 feet across, and about 25 to 30 feet deep, and with surprisingly vertical walls. When I asked how the collection vehicles were expected to



Site layout of the Pinellas County Landfill (circa 1980), "Figure 3. – Design of the Pinellas County Landfill", from "U. S. Geological Survey, Water Resources Investigations Report 82-30, Hydrogeology of a Landfill, Pinellas County Florida"; March 1983, by Mario Fernandez, Jr.

safely discharge their loads, I was told they would be directed to the cell's edge, where, over time, a ramp would be constructed out of garbage and trash! My reaction, to say the least, was not very positive. But I was told "not to worry" because "That's the way we've always done it."

Upon discussion with my (new) staff, we immediately asked the County's Risk Management Department to help assess the safety risk of this planned disposal procedure, and to assist in designing a solution. The outcome was to construct a long earthen ramp that collection trucks could safely negotiate in order to fill the trench with solid waste and be appropriately compacted ... from the bottom-up. From then on landfilling was shifted to the existing high-rise areas, until the remaining 40 acres of unexcavated/unfilled area could be designed and permitted as an area-fill.

As mentioned at the onset of this article, Pinellas County has nearly completed a 30-year Solid Waste Master Plan. One of the Master Plan's key goals is preservation of the County's landfill space. Fortunately, over the years, landfill design and operations have changed substantially so that the Bridgeway Acres Landfill's useful life has increased from about 30 years (1999 estimate) to more than 80 years (current estimate). Keeping as much solid waste out of the landfill as possible, by further waste reduction, diversion and recycling, as well as constantly watching for future (long range) opportunities to acquire contiguous property, are important Master Plan objectives to the key goal of landfill life preservation.

While 80 years of projected landfill life seems like a long time—we thought the very same thing 40 years ago when the Tampa Bay area's wasteto-energy plants were built—I can tell you that those 40 years went by very quickly. As a municipal solid waste professional, you will do your future elected Boards\Councils, customers and constituents an extremely big favor by maximizing the life of your disposal facilities. You—and they will be glad you did!

Warren Smith has been a SWANA Florida member since 1980. He can be reached at (727) 515-0006.

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 for FREE!

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

Member News

Material Recovery Facility Tour Inspires Conversation About Contamination

The Florida Recycling Partnership hosted a tour of Single Stream Recyclers



material recoverv facility (MRF) in Sarasota on Friday, October 18. Attendees saw how the processing facility sorts and bales residential and commercial recyclable materials and then ships the material to end markets to make new products.

John Hansen.

SSR's Sarasota MRF includes a 92,000-square-foot processing building and 6,000-square-foot Scale House and Administration building on an 11-acre site. The facility is capable of processing 50 tons per hour of recyclable material such as plastics, cardboard, paper, aluminum, and tin. SSR is setting new standards in recycling.



Robotics.



Fiber deck.

The company is using the most advanced Artificial Intelligence robotic technology. Using these revolutionary capabilities, SSR has created the most efficient MRF in the country. The MRF also has optical scanners that use infrared light to detect specific types of material, then eject the material into their designated receptacle using pressurized air cannons.



Infrared lights.

Attendees saw how the fiber deck separates the 2D and 3D objects through agitation of rubber stars creating friction and forcing the lighter material to rise up and the heavier material to fall to the deck below.

Thank you to John Hansen, Andrea McCauley and their team for a great tour!

After the tour, Dr. Tim Townsend talked about the study on MRF contamination that he and his team are currently undertaking. They are looking at the amount of materials going into an MRF and how much is leaving as baled product and how much is headed for disposal. The study will look at both public and private MRFs and he expects the study to be completed by December 31, 2019. The Florida Recycling Partnership Foundation is sponsoring the study.

During the lunch sponsored by Goodwill Manasota, attendees talked about the problem of contamination in the recycling stream. Here are some of their ideas and recommendations:

* Education is the key! City of Tampa did a Facebook live to show the recycling process <u>https://www.</u> <u>facebook.com/CityofTampaFL/</u> <u>videos/498259784310305/</u>

* Clarify what goes into the bin by shapes not numbers; keep it simple

* Labeling—hot stamped on container; QR codes; simple peel off labels that go onto the cart.

* Labels should include a combination of images and words to help convey messaging. Use of colors (i.e. green for what is acceptable and red for non-accepted materials) and including Spanish translations can also be helpful.

* What about a special recycling emoji so kids can use it to determine what is recycled in their neighborhood?

* More recycling needed in parks and other open spaces; Lee County has solar-powered cans in the parks that take only aluminum cans and plastic bottles to limit contamination.

A special thank you goes to Wawa Stores for providing our coffee and PepsiCo for our beverages.

Kenya Cory is the Executive Director for the Florida Recycling Partnership, a coalition of top Florida companies and association with the mission to educate policy makers, business leaders, and the general public about the benefits of recycling. She can be reached at (850) 728-1054 or e-mail kenya@flrecycling.org.

City of Tampa Happenings



In August 2019 the City of Tampa Solid Waste and Environmental Program Management hosted a Facebook live with the help of their Marketing and Communications team. Director, Mark Wilfalk, and Chief of Administration, Adri Colina, took center stage on the tipping floor to root through a local neighborhood's recycling efforts—straight from the recycling truck that had just collected and dumped the recycling contents. The focus of this Facebook live was to show contamination in real time and discuss the importance of recycling right. The video had great feedback and they received several comments

that people learned of new items that do not belong in their recycling. Fighting contamination through education on any platform we can is key!

https://www.facebook.com/CityofTampaFL/videos/498259784310305/

In October, the City of Tampa Department of Solid Waste and Environmental Program Management teamed up with their Marketing and Communications

team to create a feature on contaminants in recycling. The ever so popular Bag Monster was the star of the video promoting no bags, no candy wrappers, and avoiding placing other miscellaneous plastics in recycling bin all while dancing to the Monster Mash. This video was shared on Instagram and Facebook and received very positive feedback. Followers loved the video. It was a fun way to teach people to recycle right!

https://www.facebook.com/ CityofTampaFL/videos/vb.28835915 5374/2235052590127875/?type=2&t heater

For more information, contact Shelby Lewis, Recycling Coordinator, Department of Solid Waste & EPM, City of Tampa, at (813) 348-1027 or e-mail shelby.lewis@tampagov.net.





Talking Trash Newsletter

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Upcoming Events

2020 SWANA FL / RFT Joint Summit January 26-28, 2020 Wyndham Lake Buena Vista Lake Buena Vista, FL

2020 SWANA FL Summer Conference July 26-28, 2020 Naples Grande Beach Resort Naples, FL

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