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www.wasteadvantagemag.com October 2013 Vol.4, No.10

# WasteAdvantage

magazine

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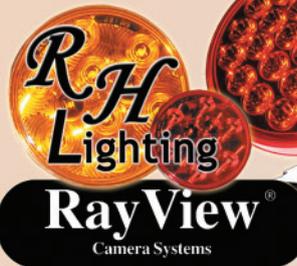
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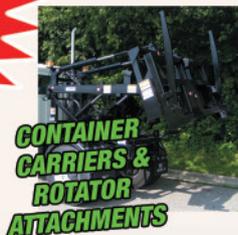
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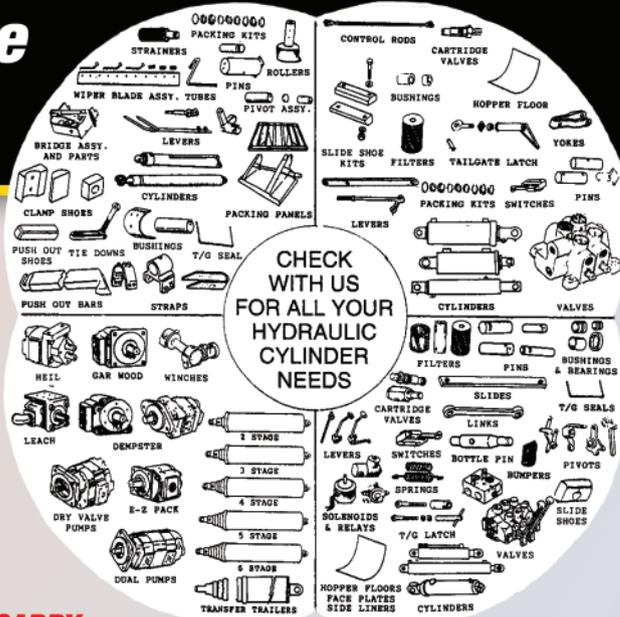
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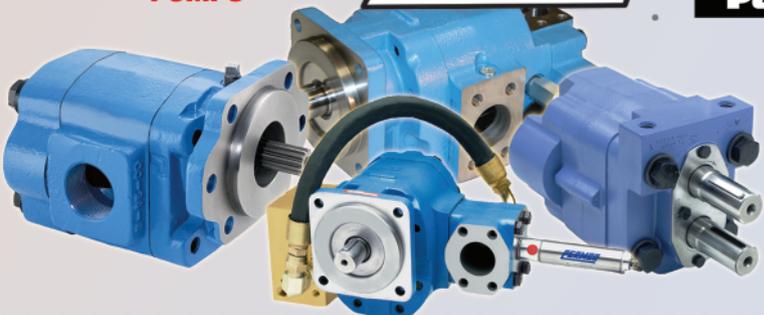
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## Editor's Note



### LAST MONTH, THE WASTE AND RECYCLING INDUSTRY GATHERED IN LONG

Beach, CA to meet and talk about technology, issues and updates that had happened over the past year. In the Long Beach Convention Center, SWANA's WASTECON show kicked off its show with a flag ceremony that included the Canadian and National anthems. The hall then filled with attendees networking, finding out about companies' products and services, as well as going to afternoon conferences. The Global Solid Waste Management Mega Session on the first day focused on issues around the world, especially in those countries that don't have any landfill regulations or streamlined processes, as well as resource management and its future. Back-to-back, crowded Mega Sessions started the second day of the show. The first one featured SWANA's Lawrence Lecturer Keynote, Dr. Robert Schoenberger, who presented a very interesting discussion on the evolution of solid waste management from the 1960s to the present. The second session's speaker, Michael Biddle, the President and Founder of MBA Polymers, discussed plastics recycling and what next steps we need to take in order to make the leap forward as an industry. While the exhibit hall was open, conferences were going on and attendees were able to hear presentations on flow control, waste to energy technologies and limits, clean landfill closures in California and more. SWANA's break zone was buzzing every day from people going in and out, taking a break from sessions, walking the exhibit hall, or just stopping in to find out more information about membership, etc. The last day of the show wound down as people not only prepared to go home, but also attended the last sessions of the day. It was a great show for all and I want to say a special thank you to all of you who stopped by the booth to sign up and talk about past issues, current trends and what you would like to see covered in upcoming editions of the magazine.

I also had the pleasure of attending the Waste Conversion Technology Conference and Trade Show in San Diego around the same time. This informative conference focused on waste conversion solutions, technologies, challenges, success stories and tried to answer the ongoing question: is waste conversion solutions and technologies worth pursuing and what is the ROI? The show had a good mix of exhibitors and attendees in an intimate setting that allowed people to network, meet-and-greet, and enjoy a very informative conference.

Don't miss this month's great articles. Our spotlight is on the North Hanover County Landfill in North Carolina, a site that uses constructed wetlands to treat their leachate (page 14). Also included are articles on container or cart management after the purchase (page 18), becoming best in class with regards to insurance (page 21), dealing with multi-generational workplaces (page 30) and more.

Don't forget to fill out an application for the Green E Awards. Fill out the form included in this issue or go online to [www.wasteadvantagemag.com](http://www.wasteadvantagemag.com) to download one. This award represents those in the waste and recycling industry who are making a commitment to using better chemicals. The deadline has been extended to November 30 so be sure to send in an application if you haven't already, and let us know if you have any questions about it. As always feel free to contact me with any comments, suggestions or questions. We look forward to hearing from you.

Best Regards,

Angelina Ruiz  
Editorial Director

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Newport Environmental Technologies  
Newport Beach, CA

# WasteAdvantage<sup>magazine</sup>

The Advantage in the Waste and Recycling Industry

#### PUBLISHER

Gary Orfe  
[gary@wasteadvantagemag.com](mailto:gary@wasteadvantagemag.com)  
(800) 358-2873 Ext. 2

#### EDITORIAL

Editorial Director  
Angelina Ruiz  
[angelina@wasteadvantagemag.com](mailto:angelina@wasteadvantagemag.com)  
(800) 358-2873 Ext. 7

Associate Editor  
Meghan Pirone

#### ART/PRODUCTION

Director of Production/Design  
Heidi Jensen  
[heidi@wasteadvantagemag.com](mailto:heidi@wasteadvantagemag.com)  
(800) 358-2873 Ext. 8

#### CIRCULATION

Candace Schmidt  
(800) 358-2873 Ext. 6  
[candace@wasteadvantagemag.com](mailto:candace@wasteadvantagemag.com)

#### SALES

Director of Sales and Operations  
Noreen Cocron  
(800) 358-2873 Ext. 1  
[noreen@wasteadvantagemag.com](mailto:noreen@wasteadvantagemag.com)

Sales Executive

Marcus Rubio  
(800) 358-2873 Ext. 3  
[marcus@wasteadvantagemag.com](mailto:marcus@wasteadvantagemag.com)

National Sales Manager

Sarah Winner  
(800) 358-2873 Ext. 4  
[sarah@wasteadvantagemag.com](mailto:sarah@wasteadvantagemag.com)

#### ACCOUNTING

Accounting Manager  
Elisa Weil  
[elisa@wasteadvantagemag.com](mailto:elisa@wasteadvantagemag.com)  
(800) 358-2873 Ext. 5

#### WASTE ADVANTAGE, LLC.

PO BOX 30126  
PALM BEACH GARDENS, FLORIDA 33420-0126  
TEL: (800) 358-2873 • FAX: (888) 871-4515

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Track your container fleet with RFID or barcode delivery verification.

Photo courtesy of Otto Environmental Systems North America, Inc. (Charlotte, NC).

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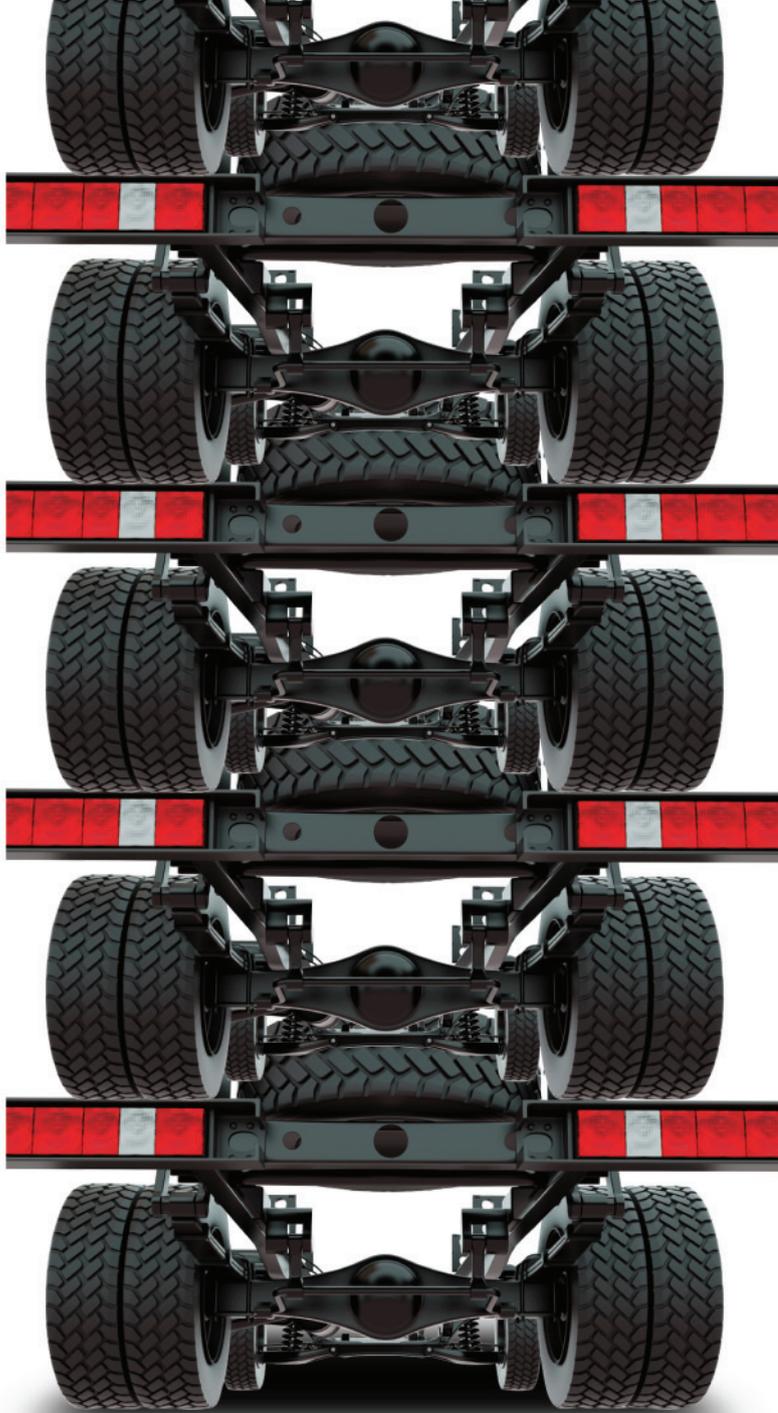
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Photos courtesy of New Hanover County Landfill, Otto Environmental Systems North America and Zonar.





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## Waste Advantage Magazine Announces National Sales Manager

**WASTE ADVANTAGE MAGAZINE** (Palm Beach Gardens, FL) announces that Sarah Winner has joined the publication as National Sales Manager. Winner has more than 10 years of experience in the sales field, with six years specializing in media sales, consulting, strategy and conferences. Her background includes a focus on trade

publications, niche markets and large industry clientele. Winner's involvement in the waste and recycling industry for the last five has included central sales manager with *Waste & Recycling News*, where she was successful in assisting the growth of multiple trade shows and also helped create positive growth in the advertising sector. "We are very excited that Sarah Winner has joined the *Waste Advantage Magazine* family," says Director of Sales and Operations, Noreen Cocron and Publisher, Gary Orfe. "She brings to our publication the experience and knowledge that we want to take *Waste Advantage* to the next level."

Winner looks forward to working with the *Waste Advantage* team and developing solid relationships with those in the waste and recycling industry. "I am excited to jump on board. The *Waste Advantage* team is dedicated to perfecting its product for the benefit of the industry and I am lucky to be a part of it."

*For more information, visit [www.wasteadvantagemag.com](http://www.wasteadvantagemag.com).*

## Hendrickson Announces 2014 Communication Campaign

This year marked the 100th year anniversary of Magnus Hendrickson founding the Hendrickson Motor Truck Company in 1913. Today, **HENDRICKSON** (Itasca, IL) is a leading manufacturer and supplier of medium- and heavy-duty suspension systems and components to the global transportation industry. "Hendrickson realizes in today's competitive industry we cannot rest on our past 100 years of success. We must continue to develop innovative products that provide value to the end user and ensure our future. To that point, we are excited about our 2014 corporate communications campaign titled 'Solutions Through Innovation™,'" states Mark Slingluff, director of marketing and communications at Hendrickson. "In conjunction with our new corporate theme, we will implement product messaging and images designed to show the versatility and benefits of Hendrickson's expansive product portfolio. As trucking's second century begins, Hendrickson looks forward to serving the heavy-duty commercial vehicle industry for the next 100 years.

*For more information, visit [www.hendrickson-intl.com](http://www.hendrickson-intl.com).*

## Craft Equipment Purchases American Waste Control

**CRAFT EQUIPMENT COMPANY** (Tampa, FL), a material handling equipment, waste reduction and construction specialty equipment distributor, announces their purchase of American Waste Control of Florida (AWC). The acquisition of AWC will further strengthen Craft's operations in the four southernmost counties of Florida, including Miami. American Waste Control is known in South Florida for the sales, service and installation of all waste reduction equipment, including balers and compactors. "Our association with Craft will take AWC to the next level," said John Sobota, Vice President of Waste Reduction company-wide for Craft Equipment Company. "Providing us with additional buying power, new economies of scale, and will allow us to offer customers a wider variety of services."

*For more information, visit [www.craftequip.com](http://www.craftequip.com).*



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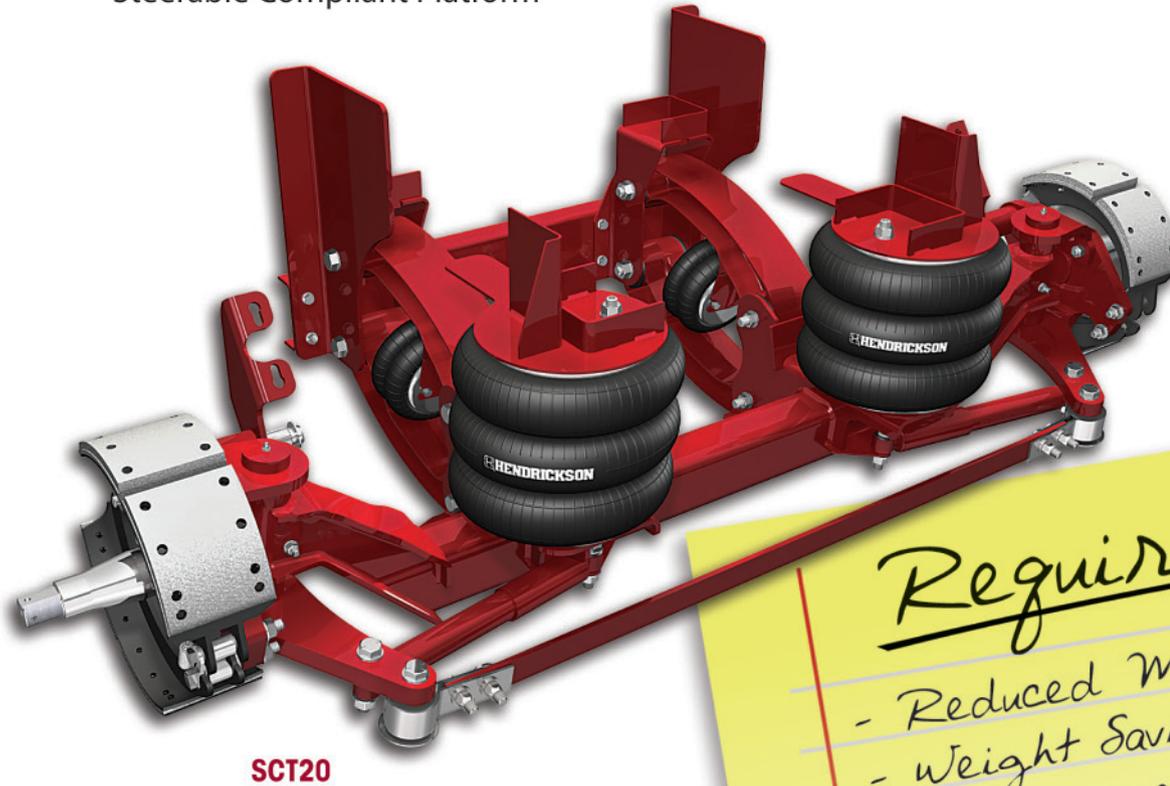
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# Mark Your Calendar



## OCTOBER 2013

### 20 – 23: REFORE13 13th Annual Conference on Renewable Energy from Organics Recycling

Hyatt Regency Columbus  
Columbus, OH  
<http://biocycleenergy.com>

### 21: SWANA Southern New England 10th Annual Recycling and Solid Waste Conference

Jiminy Peak Mountain Resort  
Hancock, MA  
[www.swana.org](http://www.swana.org)

### 23 – 24: WHEN Recycling Expo North 2013

York Fairgrounds  
York, PA  
[www.whenrecyclingexpo.com](http://www.whenrecyclingexpo.com)

### 29 – 30: Northeast Recycling Council 2013 Annual Conference: Organics Management in the Northeast—Its Time has Come

Hotel Northampton  
Northampton, MA  
[www.nerc.org](http://www.nerc.org)

### 29 – 30: World Bio Markets USA: The Race for Scale

Parc 55 Hotel  
San Francisco, CA  
[www.greenpowerconferences.com](http://www.greenpowerconferences.com)

## NOVEMBER 2013

### 12 – 14: Renewable Energy World Conference & Expo North America

Orange County Convention Center  
Orlando, FL  
[www.renewableenergyworld-events.com/conference.html](http://www.renewableenergyworld-events.com/conference.html)

### 13 – 14: Small-Mid Scale LNG Infrastructure USA Conference

Sheraton Houston Brookhollow Hotel  
Houston, TX  
[www.lngsupplyevent.com](http://www.lngsupplyevent.com)

### 18 – 20: Renewable Energy from Waste Conference

West Palm Beach Marriott  
West Palm Beach, FL  
[www.rewconference.com](http://www.rewconference.com)

### 18 – 21: 2013 North American NGV Conference & Expo

Georgia World Congress Center  
Atlanta, GA  
[www.cleanvehicle.org/conference/2013/index.shtml](http://www.cleanvehicle.org/conference/2013/index.shtml)

### 19 – 20: SWANA Minnesota Chapter's RAM/ SWANA Conference

DoubleTree Hotel  
Bloomington, MN  
[www.recycleminnesota.org](http://www.recycleminnesota.org)

### 20 – 21: Canadian Waste and Recycling Expo 2013

Palais de Congrès de Montréal  
Montreal, QC  
<http://canadian-waste-recycling-expo-us.messefrankfurt.com>

## JANUARY 2014

### 21 – 23: World LNG Fuels 2014

George R. Brown Convention Center  
Houston, TX  
[www.worldlngfuels.com](http://www.worldlngfuels.com)

### 25 – February 1: SeminarFest 2014

Rio All Suite Hotel and Casino  
Las Vegas, NV  
[www.asse.org/education/seminarfest13](http://www.asse.org/education/seminarfest13)

### 26 – 29: U.S. Composting Council Annual Conference & Tradeshow

Oakland Marriott City Center  
Oakland, CA  
[www.compostingcouncil.org/conference](http://www.compostingcouncil.org/conference)

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## SWANA and NSWMA Call on EPA to Develop Final Rules Exempting Biogenic CO<sub>2</sub> Emissions

In a joint letter to the Administrator of EPA, NSWMA and SWANA requested swift and scientifically-sound action be taken by the EPA to develop a final rule providing a categorical exclusion for biogenic CO<sub>2</sub> from the management of municipal solid waste from the PSD and Title V requirements of the Clean Air Act. The groups' letter cites a recent ruling by the U.S. Court of Appeals for the District of Columbia, striking down the "Deferral Rule". The letter explains how prior to this ruling, EPA had been relying upon this deferral to provide the necessary time for study of biogenic CO<sub>2</sub>. SWANA and

NSWMA are calling on EPA to move forward with a rule that permanently excludes biogenic CO<sub>2</sub> emissions for solid waste management.

NSWMA President and CEO Sharon H. Kneiss stated, "The exclusion that we are seeking promotes the administration's goals for materials management and landfill diversion. Furthermore, EPA's determination of the regulatory status of biogenic CO<sub>2</sub> will have very significant consequences for the regulatory burden associated with the Prevention of Significant Deterioration (PSD) and Title V greenhouse gas permitting requirements under the Tailoring Rule. The decision will also have enormous consequences for other administrative priorities to promote production and use of renewable fuels and renewable electricity. If EPA were to not exclude biogenic CO<sub>2</sub> emissions from MSW, the agency would discourage technologies that help the U.S. achieve the reductions the Tailoring Rule was designed to accomplish."

SWANA's Executive Director and CEO, John Skinner added, "EPA's deferral rule for biogenic carbon emissions was a sensible way to manage this issue when it was created. This decision by the U.S. Court of Appeals does not change the fact that treating biogenic and anthropogenic carbon emissions the same is detrimental to the country's environmental and economic health. Biogenic emissions from the management of MSW do not introduce new carbon into the existing natural carbon cycle. Therefore, we urge EPA to move quickly to remove the uncertainty caused by this decision."

*For more information, visit [www.SWANA.org](http://www.SWANA.org).*

## EIA Hires Education Director

EIA welcomes a new education director to the association. Sheila Alkire will work closely with association and staff members to identify, develop and implement high-quality and profitable in-person and e-learning programs for association members and others to fulfill training, education, certification and continuing education unit requirements through association programs. Alkire brings 16 years of corporate training expertise to EIA. Prior to joining EIA, she was the training and rollout project manager for Freddie Mac, where she oversaw all training, rollout and adoption activities of large scale system enhancements in the multifamily housing division.

*For more information, visit [environmentalistseveryday.org](http://environmentalistseveryday.org).*

## SWANA Supports Doña Ana County Flow Control Ordinance

The proposed flow control ordinance being adopted by Doña Ana County, New Mexico, has received the support of SWANA. The Five Year Business and Master Plan of the South Central Solid Waste Authority (SCSWA) of Doña Ana County recommended the adoption of a flow control ordinance because of identified benefits to residents and commercial property owners, reductions in illegal dumping, and enhancements to the area's recycling and sustainability programs. "It is apparent SCSWA determined the extent the ordinance is allowed by law, considered the economic, environmental and social impacts, and engaged in public discussion with residences, business and other interested parties. You are developing the ordinance consistent with SWANA's flow control policy and SWANA supports the County's adoption of the ordinance as a legitimate instrument of integrated municipal solid waste management."

*For more information, visit [www.swana.org](http://www.swana.org).*

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## New Hanover County Landfill: Turning Its Surrounding Environment Into Its Greatest Asset

Using constructed wetlands to manage the landfill's leachate, this innovative operation has taken the reigns in FINDING UNIQUE WAYS TO MEET THEIR GOALS.

**AS THE FIRST LINED LANDFILL IN NORTH CAROLINA,** the New Hanover County Landfill is no stranger to being a unique operation. It sits on 689 acres, 450 consisting of natural wetlands to the north and east—including the Northeast Cape Fear River and Fishing Creek. Opened in 1981, the landfill serves New Hanover County including the City of Wilmington and the beach communities of Wrightsville Beach, Carolina Beach and Kure Beach. The site geography poses challenges many landfills don't face. Onsite soils consist of coarse grained "beach sand" not conducive for Subtitle D construction requirements regarding the two foot clay layer. As a result, early management instituted the use of double synthetic liner systems in lieu of the clay layer. The liner for the first cell constructed at the site consists of a layer of PVC and one of hypalon. To this day, staff continues to use alternative double synthetic landfill liner designs at the site that exceed Subtitle D requirements. New landfill cells are constructed with double 60 mil HDPE liners, a bottom geosynthetic clay layer (GCL) and composite drainage net layers (CDN) over both the primary and secondary liners. Says Landfill Manager Sam Hawes, "While some might say the site is poorly located for a landfill, we believe the site is an excellent location as extensive natural wetland areas exist between the landfill and adjacent surface waters. If in the future any potential stormwater runoff or potential groundwater contamination occurred, these natural wetlands would provide excellent buffering and treatment of contaminants prior to reaching surface waters."

### Leachate Management Challenges

In the same way that site geography (onsite soil consisting of beach sand) presents challenges

regarding cell construction, it also creates challenges regarding leachate management. Since cover soils consist of coarse grained sand, precipitation readily infiltrates the waste on the landfill instead of being shed as stormwater. As a result, the volume of leachate generated at the site is higher than most other similarly sized facilities. "Our average annual rainfall exceeds 54 inches per year and that can go a lot higher in years we experience direct or indirect effects from hurricanes or tropical storms that ride up the East Coast," says Hawes. In an effort to shed stormwater better and also extend services not already available to County citizens, a yard waste management program was recently initiated. The yard waste will self-decay to the point where it can be used as daily and intermediate cover on the landfill. The resulting topsoil will not only shed stormwater better but will also reduce erosion issues and reduce the cost to import topsoil.

The facility is also unique in that staff treats landfill leachate onsite with a biological treatment plant prior to NPDES discharge into the Northeast Cape Fear River. "We're permitted to treat and discharge up to 50,000 gallons/day and do so at a cost less than that to pump and haul to a publicly owned treatment plant." Although staff does a terrific job at treating the leachate by conventional means they've always looked at better more sustainable alternatives.

### Constructed Wetlands

One of the projects that Hawes is most proud of is using constructed wetlands to manage the landfill's leachate. After extensive research, staff partnered with North Carolina State University and obtained grant funding from the Water Environment Research Foundation and NC Division of Coastal Management (Coastal Area Management Act) to proceed with a pilot research project. The pilot wetlands project ran from 1996 to 1999 and gained both national and international attention with dignitaries from both Thailand and India visiting the project site seeking low, cost-effective treatment options for their countries. Results of the research indicated the wetlands could treat landfill leachate and did an exceptional job treating total nitrogen. So, with positive research results, staff began discussing how to possibly link the



Top: New landfill cell construction.  
Bottom: Leachate irrigation.  
Images courtesy of New Hanover County Landfill.

constructed wetlands treatment ability with other sustainable practices. Staff desired to eventually eliminate their NPDES discharge, so the project was born to link a large scale wetland treatment system with land application onto closed landfill cells to reduce and eventually eliminate surface water discharge. As a side benefit, the treated leachate to be land applied would serve as a low grade liquid fertilizer replacing the need to purchase and apply pelletized fertilizer onto closed landfill cells to maintain vegetation cover.

After securing additional grant funding from the North Carolina Clean Water Management Trust Fund, six acres of manmade constructed wetlands were constructed in 2002. "It's been a great project. It has allowed us to reduce our permitted discharge by about 40 percent. As we close more landfill space in future years, we'll expand the irrigation system, allowing us to get closer to zero discharge, which is our ultimate goal," says Hawes. "Implementing the use of the constructed wetlands is on the cutting edge of technology and reveals the commitment the County has to manage leachate and solid waste through the use of sustainable practices. While there's a cost to go the extra mile, there's also tremendous value."

### The Changing Economy

This same commitment has been deployed across all aspects of the landfill operation to become as effective and efficient as possible. In this challenging economy, that's more important than ever. One of the ways they've done this is to implement the use of GPS on their heavy equipment. The use of GPS allows the operators to see in real time where to cut and fill waste so that all available airspace is used. GPS also makes it easy for the operators to make sure they get enough passes over the waste to get the best compaction possible. Both



Pilot wetlands treatment system used for research.

initiatives drive down the cost to operate as well as extend the life of the site. They've also replaced and reconfigured the scale house to process customers more effectively. "To our customers time is money and the quicker we can process them both in and out with 100 percent accuracy makes a big difference regarding customer service," says Hawes.

Although the total waste stream for the county did drop significantly due to the economy and the downturn in construction, this drop did not impact the total tonnage of waste managed at the landfill. This was because the County owned and operated waste-to-energy facility was recently laid-up and the tonnage directed to that facility is now coming to the landfill. Hawes says, "Last year we received 215,000 tons and even though it's still down from where it was in 2006 we're beginning to see an uptick."

He points out that they take safety very seriously as well. Everyone on staff uses two-way radios so they can constantly communicate with each other and

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## New Hanover County Landfill: Turning Its Surrounding Environment Into Its Greatest Asset

weekly safety meetings are held. They are also in the process of creating a safety committee that consists of landfill employees who will assess the site once per month and make any needed recommendations. Regarding heavy equipment training, staff train in-house, but are beginning to look at the use of Caterpillar simulators for additional training. Additionally, a county safety officer conducts all of the annual OSHA required training. “For specialized training, we send our operators, supervisory level and management level staff to SWANA’s landfill operator’s training school and MOLO classes for certification.” Other regulatory permits require additional staff training for spray irrigation, wastewater treatment and drinking water. The County as a whole also has a customer service initiative where employees are required to take at least two customer service training courses each year.

### Community Outreach

The New Hanover County Landfill is proud to open its doors for community and educational tours, whether it is for children’s camps, public and private schools or other community groups, such as the League of Women Voters. “We like conducting tours because no one really has any idea of what goes on after the trash is picked up and delivered to a landfill. When they get here they discover there is much more going on than anyone ever really imagines. It’s a great educational tool for us,” says Hawes.

He also points out that the landfill recently started a household hazardous waste program. Hazardous waste is accepted six days per week from citizens. The facility takes everything from fertilizers, pesticides, herbicide and batteries to florescent bulbs, waste oil, SHARPS, antifreeze and paint. “It’s been a real success. In the

past, we would just hold an annual household hazardous waste drop off day and we would just be swamped. We knew that people wanted the service for years and now it is available for them to use.” As for some of the household hazardous waste, batteries are recycled, the latex paint is shipped back to the landfill where it is blended with their posi-shell ADC, oil-based paint and other flammable liquids are used for fuel in boilers. Anything that can’t be recycled is properly disposed of by the contractor at a permanent hazardous waste facility.

### C&D Processing

Hawes stresses that another accomplishment at the site is their construction, demolition, industrial and commercial waste processing site where recyclable materials are diverted from the landfill. Materials diverted include wood waste, OCC, shingles, carpet, mixed metals and sheetrock. Beginning operations in 2003, equipment used at the site includes a loader and excavator. “It’s a primitive system, but it’s something that we’ve been adding to slowly over time to pull commodities from the waste. We’re hoping in the future that we can expand that operation by adding additional staff to sort and equipment to sort with—right now it is a two-man, manual operation,” Says Hawes “If you look at our waste stream, there’s a lot more material that could be diverted from the landfill. Last year we diverted about 6,000 tons.”

Wood waste is ground up and marketed as boiler fuel, the sheet rock is picked up by a composter, the concrete is used onsite for roadways, shingles are ground for use in asphalt for roads, mixed metals are recycled at one of several local metal recyclers, carpet is collected from a local carpet recycler, and OCC is transported to the County recycling operation where it is baled and marketed. Hawes believes there is at least 50,000 additional tons of waste per year they could remove from the waste stream if the right assets were in place. “We’re not solely looking at it from a revenue perspective, but also as a way to extend the life of the landfill and reducing the wear and tear on our equipment.”

### Long-Term Goals

Hawes says that the long-term plans for the site include conversion to a County park with an environmental education center. “The location of our site lends itself to that because we are bordered by natural wetlands and the river. One day we are going to have public canoe launches, hiking trails and observation points. We have a lot of wildlife out here as well—eagles, deer, bobcats, rattlesnakes, bears, etc.—and we have a threatened plant species on our property called the Big Three-awn Grass. It’s an arid grass that thrives in disturbed areas. We plan to create habitat restoration areas on our North property for the plant to grow on and plan to leave in place un-disturbed habitat buffers along the perimeter of the site.”

Leachate treatment, natural wetland ecosystems and the threatened plant species will all be included as part of future environmental education efforts. “There is a lot of educational opportunity on the site,” says Hawes. “We are at a point where we are close to reaching capacity on our north property and we will soon be moving onto our south property, which is in the permitting phase now. Once we move onto the south property, we will begin to restore habitat for the threatened plant species and also begin, in phases, development of the canoe launches and hiking trails. As technology continues to evolve in the waste industry, I believe we’re going to see less reliance on landfills and more recycling and a move towards more waste-to-energy applications; we are doing our part to take steps towards that transition now.” | **WA**

For more information, contact Sam Hawes at (910) 798-4454 or e-mail [shawes@nbcgov.com](mailto:shawes@nbcgov.com).

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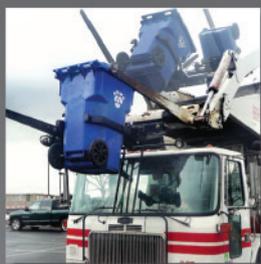
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## Container Management Logistics

Kenn Budlong

**Understanding what happens after a CONTAINER OR CART FLEET PURCHASE.**

**IMPLEMENTING A SUCCESSFUL WASTE MANAGEMENT** program is multi-faceted. While the key goal is removing community waste, it's a fact that the process has many moving parts, with a significant one being container management and logistics. One of the most noteworthy developments to occur in waste management has been the ability to purchase container/cart fleets for use by customers—and outsource their overall handling and administration.

### **Step One: Assembly and Distribution (A&D)**

The moment that a purchase occurs, the start date of the overall program is considered and a project management team immediately begins preparing phase-by-phase schedules, deadlines and expectations.

The overall goal of the process is to ensure efficient distribution scheduling, establish effectual truck routes and track progress through daily reporting. Moreover, it is absolutely imperative that certain project-specific factors are considered. For instance, what city requirements are present? Are there IT services or special conditions involved? What is the specific production and deployment schedule? The success of an A&D project exponentially increases when all parties are involved with creating the plan and meeting their deliverables.

These are important parts of the process, as they will not only allow a logistics provider to efficiently deliver strategy, but will also allow for container fleet tracking and increased program participation among community members.

Container lid replacements can be made by removing the hinge pins and then exchanging the lid.



Photos courtesy of Otto Environmental Systems North America.

## Work Order Management Strategy

As the program is implemented, the container fleet must be tracked. The latest technology offered uses RFID/barcode systems that link the cart and the address through geo-coding. With the ability to confirm verification in real-time, orders can be accessed, updated and closed while in the field via convenient hand-held scanning devices—allowing for time savings and a reduction in labor costs. Moreover, RFID/barcode scanning systems have proven successful in reducing errors, eliminating duplicate records and reporting on exceptions—protecting long-term viability measures.

## Understanding Container Logistics

Much of the success of a comprehensive waste management program is based on community-level acceptance. Outsourcing container logistics allows for transportation and delivery to individual customers and provides for the container fleet to be managed and monitored while in the customer's possession. For instance, replacement of missing, broken or stolen containers must be handled, as does container removal for customers who have canceled their service or who have had their service terminated for non-payment. This cuts down on unnecessary waste. Customers who have collected multiple containers for other purposes can be identified and this equipment used by other clients.

## Container Maintenance as an Investment

Since containers are tangible products, it is necessary to extend material life. This includes repairing lids, wheels, axles, lift bars, welding components and washing containers as needed. This will protect your investment and leave customers happy with the overall service and experience.

## Inventory Management as a Best Practice

Successful waste management programs consider long-term objectives—and a key piece of this is container inventory management. It is necessary to oversee supplies to maintain an organized facility and proper stock levels that come with an alert system when inventory is low. This can often be done by recycling parts of containers that are no longer able to be used in service. For example, a container that is broken beyond repair can be stripped of its lid, wheels, axle or lift bar and then used again for a container that may have a need for a component in order to be placed back in service. This style of inventory management reduces the overall expense in purchasing replacement stock. Initiating this back-end process allows for efficient supply chain management and benefits the end user.

## Route Audits for Strategy Adjustment and Overhead Reduction

As a program progresses, and processes mature, periodical route audits are required. As customers come, and sometimes go, an audit serves to put money back in your pocket while addressing specific issues. Non-paying customers who still receive service are identified. Additionally, to control internal overhead costs and prevent injuries, container conditions must be monitored and external safety hazards reported. Ensuring the auditing process is efficient protects workers and optimizes all equipment.

## Lifecycle Operations: Container Evaluation and Recycling

Like all consumer-used materials, eventually containers wear out and need replacing. It is necessary to identify which need to be repaired and



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## Container Management Logistics

which containers should be recycled at the end of their useful life. You also must take into consideration where operator behavior might be impacting overall container lifespan—and implement training to reduce unnecessary expenses.

Finally, note that sustainability and waste reduction start at home. A recycling program will allow old, broken or undesirable containers to be removed from service and purchased by companies no matter their condition or manufacturer. Once the containers are picked up through a coordinated reclamation team, they will be ground into flake and/or pellet material. Additionally, container manufacturers are realizing the benefits of using recycled materials, which cut down on long-term waste.

## The Benefits of a Container Management Strategy

The container management process is only one part of an effective waste program—but when done correctly, it has an immediate and lasting impact. There will be fewer issues in the pickup process as containers will remain in good shape, which will in turn contribute to increased productivity among your program's staff members. Not having to handle broken, damaged or faulty containers will allow them to be more efficient on their route. As a result, overall operations will be affected, which will contribute to customer satisfaction and retention. And finally, by ensuring that your program also provides for customer and container recycling, your



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organization's overall carbon footprint will be reduced and less landfill material will be created, lowering tipping costs and keeping more money in your organization's budget. | **WA**

*Kenn Budlong is the vice president of service with Otto Environmental Systems North America, Inc., a full service solutions company specializing in products and services for the waste and recycling industry. For more information about Otto's residential and commercial containers as well as their container management services, visit [www.otto-usa.com](http://www.otto-usa.com).*

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## Becoming Best in Class Takes More Than Talk

Nathan Brainard

**If you take a proactive approach to your claims mitigation, YOU STAND A MUCH BETTER CHANCE OF CONTROLLING CLAIMS as opposed to hoping they simply don't happen.**



**LET'S BE HONEST, WE ALL WANT TO BELIEVE OUR** company is truly the best in the industry. We feel our company can outperform the competition from both a physical service and customer service standpoint. If we can't believe we have built something better than the competition than who will? As a company executive or owner you have to believe this or odds are you are preparing to sell or close your doors. As entrepreneurs, we are wired to believe that we can do it quicker, more efficiently and with a better end result than anyone else in the marketplace. The real question, however, is how do we prove it?

Insurance carriers have pulled back the reins over the past year. They are being more selective than they have been in the past 10+ years because the hardening of the market allows them be selective in who they offer policy terms to. When an agent is working with an underwriter they are asked all sorts of questions about your company, safety culture and safety program, claims, owner involvement and a myriad of other items so they can get comfortable in offering a proposal for your review. If they can't get comfortable with the workplace initiatives you have in place, odds are they are not going to offer you terms and move onto another submission they are more comfortable with. So, what can you do to help elevate your company from, "just another submission" to something showing you truly are "best in class?"

Every underwriter is going to have their own set of items they want to see implemented within your company. The more of these items you have in place the better since the underwriter can then make a case internally as to why they offered you the coverage and premiums they put forth. We are going to discuss some of the more "global" items an underwriter looks for. Obviously, there are more than what is written here, but if we address those that are the most common, you will at least have a place to start your evaluation of how your company stacks up.

### Training

While there is no news flash here, it is the most widely asked question by underwriters. They want to know if you have a formal, written training program. Do all

new hires go through the program? How long does it last? Is there ongoing training throughout the year, or do you only train the folks when they are originally hired and then let them do their work? Do you have a dedicated Safety Director? If so, do they spend 100 percent of their time on safety related matters, or do they have other non-safety related duties?

The more training you do the better. It is widely recommended that you incorporate various types of training. This would include classroom, online and in the field as well as your normal weekly or monthly tool box talks. As the employees in our industry have varying degrees of education as well as potential language barriers, a multifaceted training approach is considered ideal. For any training you provide to the employees, you should document both the topic and attendance. You can then add records of all training by employee to their file in the event that they ever have a claim and state that he or she was not trained on a specific subject.

One of the largest pitfalls we see by companies is cessation of training because their claim count is very low. This is a terrible idea. When claims are not happening or are very low you should take the opportunity to further educate and train the employees. While things are good now, you don't want your employees to become lackadaisical or complacent—they get careless and that is when a claim happens. Constant training is the foundation for a "best in class" environment.

### SAFER Score/Pre- and Post-Trip Reports

While the latter are internal documents, their use is widely documented whether you are aware of it or not in the form of a SAFER Score. If you are scratching your head, look no farther than your last DOT inspection. Each time your vehicle is stopped and inspected by DOT, a report is generated. This information is then passed on and published at [www.safersys.org](http://www.safersys.org). Underwriters are using this tool more and more frequently. They are also putting a tremendous amount of weight on the results of this information.

Continued on page 24.

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## Becoming Best in Class Takes More Than Talk

Continued from page 21.

Once on the Web site, they can search by your company name or DOT number. After locating your company in the system, they are able to see a wealth of information they consider vital to their process. This would include information such as, the last time your MCS-150 was filed (should be done annually), what your company's Operation Class is, whether you are Intrastate or Interstate licensed, what types of goods/materials you haul, the results of your DOT inspections for the past 24 months (Out Of Service ratio compared to industry average), as well as crash data and driver inspection info.

We have found a majority of companies are not aware underwriters use this tool. Furthermore, they are not aware of the amount of importance underwriters place on this data. Because a majority of the information within this site is verifiable they put a large emphasis on it. If you are running a 39 percent Out Of Service Rate against an industry standard of 20 percent, you are now fighting an uphill battle with this underwriter.

This makes your pre and post-trip inspections paramount. Your drivers should be trained to not only conduct their inspections, but also to submit their results to their supervisor or head mechanic daily. If there are items that need attention, they can be addressed and the vehicle can be brought up to a passing standard. This will not only be reflected in your SAFER Score, but will also help alleviate fines imposed by DOT.

Recently, I met with a client who's SAFER Score was dismal at best. They were not aware they needed to be filing an MCS-150 on an annual basis. Their head mechanic had become complacent and had stopped doing it four years earlier. This threw off their listed vehicle and driver count, which had serious implications to their Out of Service Rate. While they had not had any auto accidents other than minor fender benders over the past two years, the underwriters were declining the account because they felt the company was placing unsafe vehicles on the road. Furthermore, the client was irritated as he felt his company was being picked on by DOT. DOT would wait for the company trucks to come out of the landfill and hit them with an inspection. Generally, landfill roads are unpaved and tend to be bumpy. This causes items such as light bulbs to wiggle loose, mud flaps to come off, etc. All of these are reportable in the Out Of Service category on the SAFER Web site.

The best way to combat the DOT "cherry picking" approach is for your driver to have a copy of the pre-trip inspection they conducted that morning in the cab with them. While it may not necessarily get you out of the citation, it could help. The drivers need to be diligent in their duty of operating a safe vehicle around the public. As with anything else in life, most people will take the path of least resistance. This is true with DOT. If you begin to earn a reputation of an "easy target" for their inspections they are going to keep an eye out for your trucks—"work harder when easy prey is abound."

### Post Offer Physicals

Does your company currently conduct post offer physicals? If not, you should give serious consideration to implementing this practice. The most common pushback we hear from company owners is there is a cost associated with this approach, and given the turnover rate associated with the industry they feel the money isn't worth spending. We understand your concern; however, would you consider it money well spent if you could prevent an erroneous worker's comp claim in the tens of thousands of dollars range that would affect your experience MOD for the next four to five years? Doctors are able to ask patients things you as the employer are not able to ask. If you send the potential hire in for a physical and a description of the work they have been offered, the doctor can determine if there any conditions within the scope of work the potential

hire cannot do. The doctor can then sign off on the fact that the potential hire is physically capable of doing the duties you have hired them for, and if they find they are not fit, you have potentially eliminated a worker's comp claim waiting to happen. A post offer physical is much less costly than a worker's compensation claim.

### Safety Equipment

Many companies have installed dual facing camera systems, backup cameras, GPS systems and many other systems to help keep their employees as well as other drivers and pedestrians safe. Insurance companies love to know about this, and in many cases they might be able to offer a premium discount for having these tools installed. There is a catch though. The systems have to be in working order and the data collected needs to be analyzed and used for training within the company. Recently, one of my clients was involved in a horrific claim where the injured party ended up having a leg amputated because of the injury. The client had a camera system in the truck, but unfortunately the recording device had been jarred loose so there was no data for use in defense of the claim. It became their word versus the word of the injured party. The claim settled for several million dollars. Had the equipment been working it potentially could have changed the outcome of that claim. If you are going to spend the money on a system, make sure you spend the money to maintain it.

The other component to this equation is whether or not the underwriter is being told about your installed technology. This is something you need to make sure you agent is aware of and sharing with the underwriters. If you are not telling your agent about this, you could be missing out on valuable premium credits.

### Driver Criteria/Progressive Discipline Plans

Every carrier who is interested in writing insurance for the waste and recycling industry has a supplemental form the agent is required to submit in addition to the standard Acord forms and loss runs. On just about every supplemental form there is a question regarding driver discipline. Most companies will tell the agent when going over this document that if the driver meets the insurance carrier guidelines they are good to go. Insurance carriers tend to feel differently about this. They want to see that a company has their own set of criteria in place, and that those criteria are more stringent than what the carrier requires. Carriers feel that if you have a written set of criteria all drivers must meet, then you are taking things very seriously. To take it one step further, if you have a progressive discipline process in writing that all drivers/potential drivers have signed off on, they really get excited. They feel you are taking the time to lay out the ground rules for your employees and by having them sign off on it they are aware of the company rules and potential repercussions of their actions. By taking your standards higher than that of the insurance carrier, you are going above and beyond the industry standard of relying on what the carrier deems suitable.

### Route Observations

While it can be argued that this is more relevant to residential collection than commercial or roll-off collection, the fact remains that it is important. If you have a supervisor monitoring a collection route and they see something that is obviously out of sorts they can take immediate action. This can prevent the same bad work habit from occurring again and also provides information that can be used to train others within the company. Finding first hand examples will always be easier for employees to relate to.



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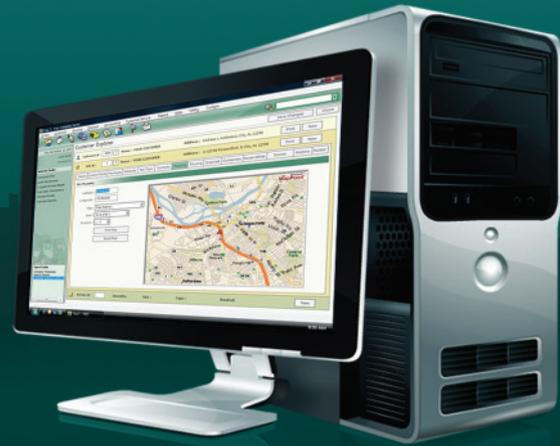
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We recommend you have a checklist of items your supervisors take with them and use so all drivers are being held to the same set of standards. It is also recommended that you provide your agent with a copy of the template so that they can share it with the carrier. Here again, carriers love to see this kind of system in place.

### Background Checks/Integrity Testing

Both of these options are starting to become more prevalent in business today. Background checks can range from a simple criminal check to full-blown history of the applicant. There is a cost to have them done, but if you were able to decline a potential hire because they had a history of workplace violence would you? What if you had a route collecting at a school and found the applicant was a convicted child predator?

Integrity testing also has a cost, but initial feedback from both employers and insurance carriers is very positive. There are several companies out there offering this service and the prices range depending on the size of your company. What is really interesting is their ability to weed out the undesirable employee. These would be the folks who apply for a job that are inclined to steal from the company, lie to you as the employer, come to work under the influence of drugs or alcohol or who might file a false claim in an effort to score a quick payout.

The ability to weed the bad apples out from the good can and will have a dramatic impact to your company from both a morale and claims standpoint. You don't want to employ individuals who will be disruptive

internally as that type of attitude can spread. You also don't want to hire someone on Monday who will have the first claim filed by the end of the first week.

### Taking a Proactive Approach

These are just a few of the items underwriters are currently putting a lot of stock in. Each carrier has their own additional set of criteria they deem valuable. If you have not done so, ask your agent what makes your carrier tick. Perhaps there is something with little or no cost that you could implement immediately that would generate a premium reduction.

It is also important to note that implementation of the above items is not guaranteed to prevent a claim. After all, claims are just another word for accidents and accidents can and will happen. This is why you buy insurance in the first place. If, however, you take a proactive approach to your claims mitigation, you stand a much better chance of controlling claims as opposed to hoping they simply don't happen. Odds are the proactive approach will also garner you some policy credits along the way. | **WA**

*Nathan Brainard is vice president, Environmental Division, at Insurance Office of America (IOA) (Longwood, FL) and a member of the NSWMA Safety Committee and ANSI Standard Committee. Nathan has been with IOA for eight years and specializes in environmental insurance with an emphasis on insurance for the waste, recycling, remediation and demolition industries. He can be reached at (407) 998-5287 or via e-mail at [nathan.brainard@ioausa.com](mailto:nathan.brainard@ioausa.com).*

# Learning From Catastrophe

Darell Luther

**Be sure to review your processes and physical set up SO YOU'RE NOT SETTING YOURSELF UP TO FAIL.**

## MONTREAL, MAINE & ATLANTIC, FOR IMMEDIATE

*release, Saturday July 6, 2013. Derailment in Lac-Megantic, Quebec. At approximately 1:15 am EST, an eastbound Montreal, Maine & Atlantic Railway train with 72 carloads of crude oil and five locomotive units derailed at the Rue Frontenac road crossing in Lac-Megantic, Quebec.*

*Early reports indicate that the train was stopped and tied down by the locomotive engineer at 11:25 p.m. on the mainline at Nantes, a station approximately 6.8 miles west of Lac-Megantic, where the derailment occurred. The engineer was not on the train ... (see the following link for the entire press release: [www.mmarail.com/sections/news/files/MMA\\_7.6.2013\\_Press.Release.pdf](http://www.mmarail.com/sections/news/files/MMA_7.6.2013_Press.Release.pdf))*

## How Do Such Events Occur?

According to the Federal Railroad Administration (FRA) (Federal Register/Vol. 78, No. 152/Wednesday, August 7, 2013/Notices page 48221) nearly one-half of all accidents are related to railroad human factors or equipment defects. From 2009 through 2012, 35.7 percent of train accidents were human factor-caused. With regards to the securement of unattended equipment, FRA accident data indicates that approximately 8.5 percent of human factor-caused train accidents from 2011 until April 2013 were the result of improper securement.

As a result of the July 6 accident and the statistics above, the FRA issued FRA Emergency Order No. 28, Notice No. 1 and Transport Canada (TC) issued an Emergency Directive pursuant to Section 33 of the Canadian Railway Safety Act. The Emergency Order and Directives provided the following guidelines to all railroads:

- No train or vehicles transporting specified hazardous materials can be left unattended on a mainline track or side track outside a yard or terminal, unless specifically authorized.
- In order to receive authorization to leave a train unattended, railroads must develop and submit to FRA a process for securing unattended trains transporting hazardous materials, including locking the locomotive or otherwise disabling it, and reporting among employees to ensure the correct number of hand brakes are applied.

Employees who are responsible for securing trains and vehicles transporting such specified hazardous material must communicate with the train dispatchers

the number of hand brakes applied, the tonnage and length of the train or vehicle, the grade and terrain features of the track, any relevant weather conditions and the type of equipment being secured.

- Train dispatchers must record the information provided. The dispatcher or other qualified railroad employee must verify that the securement meets the railroad's requirements. Railroads must implement rules ensuring that any employee involved in securing a train participate in daily job briefings prior to the work being performed.

- Railroads must develop procedures to ensure a qualified railroad employee inspects all equipment that an emergency responder has been on, under or between before the train can be left unattended.

- Railroads must provide this Emergency Order to all affected employees.

## Lessons Learned to Apply

The TC and FRA emergency orders, rules and directives are simply application of a lot of statistical research applied to a common sense approach. This approach, which is governed by two railroad administrations, is simply to work safe.

Taking the TC and FRA advice and applying it to private track in yard and terminal operations, one would want to consider the following:

- *Gradient is not your friend.* Park all railcars whether single or in groups on as flat a track as possible. Develop rules that are required to tie handbrakes on specific group sizes of railcars, e.g. tie off a handbrake on every other railcar not connected to a locomotive.

- *Training insures safe and effective operations.* An ongoing repetitive training regime is more than important, it's a life saver. Train your employees on what to do in all aspects of railcar movement, as well as loading and unloading in yards and terminals. Effective training is simple and easy to understand yet inclusive enough to address situations from daily operations to emergencies. Training should be included in daily job briefings and in cases where there are crew changes to be sure a smooth handoff of job duties occurs.

- *Documentation is paramount but shouldn't be burdensome.* A massive amount of documentation when it isn't required is worse than no documentation at all. Simple checklists that cover the process of tying down a railcar(s) or spotting railcar(s) for loading or unloading should be just that ... simple.



### Train Your Employees

- Safe & Efficient Operations
- Logical Processes



### Hold Accountable

- Fine Tune Training
- Remedial Actions



### Document Expectations

- Measurable Results
- Non-burdensome Approach

Workflow processes. Image courtesy of Tealinc.

- Accountability drives results. Giving employees the tools and training to operate safely and effectively is important. Holding them accountable to effective and safely use those tools and training is a key requirement to obtaining the results you desire.

- If you're at a loss on where to start or want to revise a current rail operations yard and terminal program, consider that it's okay to model your program after successful ongoing operations. Consider a version of the FRA/TC guidelines modified to your operations or conducting a process review internally by simply writing down the steps and then presenting them to peers for their review and input.

### Anticipated Impacts in the Waste-by-Rail Arena

To obtain a sense of expected impacts in the waste-by-rail arena, we conducted an informal survey of waste-by-rail transporters, rail yard operators and trans-load operators. Our survey was general so as not to restrict response and consisted of two questions: 1) What impacts do you expect from the MM&A derailment and 2) What will you do differently in your own operations as a result of the derailment? To protect the identity of respondents we summarized the results below.

#### What Impacts Do You Expect From the MM&A Derailment?

The overwhelming response was that rail rates are expected to rise across the board primarily for hazardous shipments and secondarily for non-hazardous shipments that are classified in the general waste category. Reasons given for the anticipated increase are to cover expected insurance premium requirements to offset transport risks, to cover increased operating costs of having not less than two man crews on all "hazardous" shipments and increased documentation process costs. Interestingly, the majority of operators/shippers believe that the set of rules and regulations that govern most hazardous and non-hazardous waste shipments are more than sufficient to ensure a safe operating environment and don't believe at the shipper/receiver/trans-load level there will be many changes, if any.

#### What Will You Do Differently in Your Own Operations as a Result of the Derailment?

The overwhelming response was that the implications of the derailment will drive a formal review of internal operations procedures and documentation. However, all respondents were very comfortable that their operations procedures and documentation processes are more robust than actually required by government and private entities.

The details of what went wrong on the Montreal, Maine & Atlantic are still being sorted out and there will be a long time spent in the discovery phase before every detail is flushed out. However, the application of lessons learned from the first review, if not already in operation at private track and terminal operations, should be applied. Remember Train – Document – Hold Accountable and most importantly, review your processes and physical set up so you're not setting yourself up to fail. | **WA**

*Darell Luther is president of Forsyth, MT-based Tealinc Ltd., a rail transportation solutions and railcar leasing company. Darell's career includes positions as President of DTE Rail and DTE Transportation Services Inc., Fieldston Transportation Services LLC, managing director of coal and unit trains for Southern Pacific Railroad and directors positions in marketing, fleet management and integrated network management at Burlington Northern Railroad. Darell has more than 24 years of rail, truck, barge and vessel transportation experience concentrated in bulk commodity and containerized shipments. He can be reached at (406) 347-5237, via e-mail at darell@tealinc.com or visit www.tealinc.com.*

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# The Garbageman's Guide: Managing a Multi-Generational Workplace

Norm LeMay and Steven Kaufman

**Every generation has characteristics that make it unique and distinctive. BRINGING GENERATIONAL DIVERSITY TOGETHER IN THE WORKPLACE CAN BE VERY POWERFUL—but can also present a unique set of challenges to employers.**

**WALK INTO ANY WASTE HAULER IN AMERICA** and there's a chance you'll see employees from four generations in the office: Veterans, Baby Boomers, Gen Xers, and Millennials. This is an unprecedented first in business history. Thin retirement savings, longer and healthier lifestyles, and "60 is the new 50" are some of the reasons why employees are extending their careers. That means more age diversity in the workplace, which can lead to some significant challenges as the different generations try to work together.

The factors that shape the way each generation thinks, acts and makes decisions are very different. In a world of "One person's treasure is another person's trash," it can be all too easy for one generation to dismiss the contributions and working styles of another. If businesses are going to thrive in this

competitive economy, everyone needs to work well together regardless of their age and background.

That's why a new term called generational competence has been making headlines. It refers to the changes a company must make to meet the needs of these four distinct generations. The goal of this article is to help your company identify and toss the problems that come with a multi-generational workforce and to put a flexible and effective generational competence plan in place.

## What is Garbage?

We're going to use the term "garbage" in this article, and by that we mean any thoughts, beliefs or opinions (or TBOs) that have no value anymore and that hamper your company's ability to move towards its goals. TBOs can take the form of dismissive behavior ("That young

## Generational Characteristics Summary

	VETERAN	BABY BOOMER	GEN X	MILLENNIAL
Born	1920-1945	1946-1960	1961-1980	1981-1995
Age	68-91	53-67	33-52	18-32
Defining Events	Great Depression Two World Wars Korean War	Social change Berlin Wall JFK, MLK, RFK Watergate Vietnam	Berlin Wall Falls Challenger OJ Simpson First Gulf War	Columbine, VA Tech OK City & 9/11 War on Terrorism Corporate Scandals
Key Traits	Believe in the value of work, not finding personal meaning in it  Sacrifice for the common good and loyalty to the company  Respects for authority	Grew up with prosperity and expansion  Less concerned about career issues. Focus on family and future security  Husband and wife likely work	Less financial security and company loyalty  Latchkey kids  Unrest and disappointment in leaders  Work/life balance	Very savvy with technology  Flooded with choices  Extremely resourceful  World broken into small "bites" of information

Images courtesy of The Garbageman's Guide.

Figure 1: Every generation has its own unique characteristics.

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## Generational Trash Summary

	VETERAN	BABY BOOMER	GEN X	MILLENNIAL
Work Philosophy	Company Loyal	Live To Work	Work To Live	Work My Way
Generational Garbage	Hold on to things emotionally Resistance to change May not transfer knowledge	Ego Expect others to embrace change Question authority Want personal contact	Natural skeptics Will change companies Two-way street with authority Very self-reliant	Want freedom and autonomy Not dependent on face-to-face contact May not dig deep enough
Office Garbage	Difficulties with technology Not as responsive to changing market and customer conditions	Questions management decisions Expects Gen X and Millennials to shake up the status quo	Questions the legitimacy of work practices Can butt heads with authority	Challenges integrating with staff Tradeoff between speed and accuracy

Figure 2: Every generation produces its own unique form of trash.

kid can't teach me anything"), outdated management styles ("They'll do it my way no matter what!") and internal conflict (a Baby Boomer and a Gen Xer who can't agree on anything). The goal is to get rid of that trash and use the space that's freed up for something new and more productive.

### The Four Generations

The first generation is called *Veterans*: men and women born between 1920 and 1945 and who would be in their late sixties and older. They have lived through some epic events in 20th century history: the Great Depression, two world wars and the Korean War.

The second generation is known as *Baby Boomers*: they were born between 1946 and 1960 and would be in their early fifties to late sixties. They were shaped by a time of huge social and political change: the advent of rock and roll, the tragedies of John F. Kennedy, Robert Kennedy, Martin Luther King, Watergate and Vietnam.

The third group is called *Gen X*, born between 1961 and 1980: they are in their early thirties to early fifties and were influenced by events like the Berlin Wall coming down, the Space Shuttle Challenger explosion, the OJ Simpson murder trial and the first Gulf War.

The fourth generation is called *Millennials*: they were born between 1981 and 1995 and are aged 18 to early thirties. Key events for Millennials include the Columbine and Virginia Tech school shootings, the 9/11 attacks, the Global War on Terrorism, and corporate scandals such as Enron.

Now that we have defined the generations, let's look at how each one thinks. Because they lived through a time of scarcity, Veterans are experienced

at scrimping and saving. They are very loyal and have usually worked at one company for decades. They grew up believing in the value of hard work more than finding personal meaning in it. Because of the difficulty of their circumstances, their creativity and resourcefulness give real meaning to the proverb, "Necessity is the mother of invention." Veterans are used to face-to-face contact and tend to respect authority, rather than automatically challenge it.

Baby Boomers are the opposite of their parents. They grew up in a time of economic expansion and security. As they matured, they began questioning the kind of future their leaders were creating. This led Baby Boomers to shake up the status quo and wrestle with traditional notions of authority. They embrace diversity, value collaboration, are passionate, driven and view their careers from the point of view of "live to work."

Gen Xers were raised in the time of downsizing and corporate restructuring. More than likely, both of their parents worked very hard at their jobs and they saw firsthand the burnout that resulted. With job security a thing of the past, this generation of latchkey kids replaced "live to work" with "work to live," focusing on finding a balance between work and family life.

Millennials are the first generation to grow up completely immersed in the digital age. Computers, smart phones and the Internet are second nature to them. The means they're flooded with choices and they've translated that into flexibility: multitasking, working from anywhere and getting things done faster. Their philosophy is "work my way," with devotion to their careers but not necessarily to their companies.

There are many other characteristics that define each generation, and some characteristics that are common to all. For example, we all look for meaning

in our work and we all want long-term stability and happiness. The traits that we've presented paint a global difference between these four important groups (see Figure 1, page 30). Now, let's focus on the types of garbage that is generally associated with each generation.

## The Garbage

Because Veterans are used to holding on to things physically, it can be difficult for them to let go of things emotionally. Conversations about relationships or feelings can be difficult for Veterans and they have strongly-held TBOs about how people should conduct themselves in the office. This may lead to foot-dragging and resistance to change and make informal work environments uncomfortable and awkward.

Baby Boomers bring a lot of ego to the table. They shook up the world their parents built. They were agents of monumental change and sometimes expect others around them to adopt the same attitude. Baby Boomers will question authority, especially if it's autocratic or imposed. Since Baby Boomers prefer personal contact to work through issues and solve problems, they may rebel against the more impersonal methods of text and email.

Gen Xers grew up watching the decline of long-term loyalty to employees, so they have a natural, inborn sense of skepticism, along with some deeply-felt TBOs that support their sense of caution. If their company doesn't provide what they need—diversity, challenge or responsibility—they'll jump to another firm to find it. They also expect a two-way street when it comes to authority: "I'll learn from you but you also need to learn from me." That can create tension between Gen Xers and their managers. Because they grew up solo, Gen Xers are more self-reliant and want to get tasks done without overprocessing them.

Millennials value freedom and autonomy. They'd rather send an e-mail than visit someone's office, especially when they're multitasking (something they do very well). Because they're inundated with information from all of their technology sources, it is harder for Millennials to sort out the garbage from what truly has value. They also engage their world in terms of information soundbites: a short Facebook post or Twitter quote or a photo on Instagram—and they generally assume this information is factual and accurate. This can spill over at the office, where they may not dig deep enough to distinguish between value and garbage.

This generational trash also creates garbage for the company, the biggest of which is one generation discounting what another generation can accomplish. This creates drama within a company that can severely impact its competitive edge. The last thing a firm needs is employees who say, "I don't care about your opinion or solution because the way you think is different than the way I think." When TBOs like that run rampant, productivity and morale almost always take a hit.

How does all of this play out in the office? Let's say a mid-level manager calls a meeting to discuss how to get more out of the weekly staff update. The Veteran will ask what conference room the meeting is in. The Baby Boomer will ask if the meeting is truly necessary. The Gen Xer will groan about the redundancy of having a meeting about a meeting and the Millennial will ask if he can attend via teleconference. If you're the manager of this diverse group, it can be very challenging to get everyone in the same room, let alone on the same page (see Figure 2, page 32).

## The Goals of a Generational Competency Program

Your company's generational competence program should have two universal goals:

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## The Garbageman's Guide: Managing a Multi-Generational Workplace

1. All employees will value the contributions of others, regardless of their age.
2. All employees will support the overall mission of the company and provide the maximum value to its customers.

Does that mean your generational competence program should focus on one generation versus another? Should you expect different results or make exceptions for members of different generations? Absolutely not! Sure, generational trash is different, but one is no more or less harmful than the other. That means every employee should be held accountable for how they contribute to the generational competence of the company. You may need to make some adaptations to the way your team works, but not at the cost of compromising your company's core values or diverting it from its mission.

At the end of the day, everyone wants to feel like they're an important part of the team. They want to feel like their opinion counts, that they matter and that they know what's expected of them. Most importantly, they want to succeed at whatever job they're hired to do and bring to bear to that job all of the experience and skills they possess. If you want the best people, you have to create the best environment. One way to do that is to remove any TBOs that are generational garbage. Let's focus on the specifics of how to do that.

### A Five Step Plan to Get Garbage Out of a Multi-Generational Workplace

#### Step 1: Aware

There is a fundamental principal when it comes to tossing out the trash in your mind and in your office: before you can get rid of it, you first have to become aware that it exists. That's why the first step in dumping multi-generational trash is to make yourself and your team aware that it exists. Talk openly about the generational differences in your company. Use the charts and diagrams in this article to point out the different ways each generation thinks and works. Discuss the kinds of garbage each generation might bring into the organization. This will help raise awareness of the issue and help employees see the garbage for themselves.

Also, as you have these discussions, make it a point to kill the stereotypes. Point out the differences, but emphasize the unique qualities each generation brings to the company. To raise awareness, create a course on generational diversity through your HR organization. Bring the issue up at staff meetings. Create a handout on generational differences. Search the terms "multigenerational garbage" and "generational competency" online. Whatever your method, don't shy away from raising the topic. That's a great way to start tossing generational garbage out of your office.

#### Step 2: Accept

Awareness is the first step to understanding, but to make a real change, your team needs to accept the differences between the generations. The best way to do that is to create a belief system inside your company that truly accepts and honors the power of a multigenerational workforce.

Have representatives from each of the four groups create a "Generation Declaration." This can be a statement of principles for your company that memorializes your commitment towards minimizing age-related conflicts. Have some fun with this! Make it rhyme or have a company-wide barbeque with the reading of the declaration as the main event. Humor goes a long way to cutting through tension and it's a great way to thaw out any inter-generational ice. The goal of the document is to take a stand against multigenerational garbage. What better way to do that than to get members of different generations working together?



The five steps of a multi-generational competency plan.

#### Step 3: Adapt

The best companies are those that learn to adapt. Once your team has formed the basis of your generational competence plan, the next step is to ask, "What changes do we need to make in the way we do things around here?" Can you offer flexible work schedules? Are you willing to conduct meetings in non-traditional ways? Can you boost the use of technology and face-to-face contact to create better communication? The goal is to make specific adaptations that will make each generation feel more comfortable without overindulging any single group. Some specific adaptations that can be made for each group are:

##### Veterans

- Encourage face-to-face communication
- Have them create knowledge transfer programs
- Provide technology training sessions

##### Baby Boomers

- Ask for their input and listen to their suggestions for change
- Give them leadership positions where they can build both team and group consensus
- Offer personal feedback whenever possible

##### Gen X

- Increase autonomy; reduce rules and red tape
- Offer flexible work schedules and support requests for work/home life balance
- Explain reasoning clearly and concisely without being dictatorial

##### Millennials

- Speed up the pace
- Offer technology solutions to internal and external problems—incorporating their input
- Deepen Millennials involvement on the team and give them real responsibilities

#### Step 4: Mentor

A Veteran has valuable insight on policy and workflow gleaned from decades in the workforce. A Millennial has an extraordinary command of technology and can get things done with blinding efficiency. How can these two people overcome a 40-year age gap and help one another perform better at their jobs?

The answer is mentoring. Put diverse members of your staff on a team, give them a specific task, and let them use their unique skills to cross train one another. Encourage each generation to pass on what it knows, whether it's information about the task, the way they solve problems, or methods to identify and toss any TBOs that are holding the organization back. Working closely in this way creates opportunities to strengthen relationships and build rapport among your staff—not to mention building respect that comes when an employee says to another, "I didn't realize you knew how to do that!"

Mentorship does not take the place of in-house training, which is a great way to disseminate information about your generational competence plan. Mentorship augments formal training because the interactions it creates knowledge transfer between employees. The strength of a company can be measured by the free flow of information inside of it. Mentoring is a great way to facilitate that flow. Encourage the Millennial to teach the Veteran how to use their iPhone and encourage the Veteran to teach the Millennial best practices for researching a problem. Assigning people to teams where you know a mentoring relationship can develop will pay dividends now and in the future.

### Step 5: Reward

We all love to be rewarded for a job well done. It's motivating and it makes the time and effort we expend worth the investment. When it's time to say, "Job well done!" you'll want to choose the best way to approach each generation.

Veterans respond well to traditional and formal methods of recognition:

financial remuneration or a plaque or a letter from a senior executive. Baby Boomers enjoy increased responsibility, additional perks, or direct praise from their manager or colleague. Gen Xers welcome offers of flex time and anything that increases the "fun factor" of their job description, while Millennials respond to more autonomy and increased responsibility given they are at the early stage of their career.

Also, consider the way in which each generation might respond to the announcement of their reward. Veterans and Baby Boomers don't mind being recognized in front of peers, while Gen Xers and Millennials might feel more comfortable one-on-one or written communication of their reward.

### Unique and Distinctive

Every generation has characteristics that make it unique and distinctive. Bringing generational diversity together in the workplace can be very powerful—but can also present a unique set of challenges to employers. By identifying the garbage that each generation brings, and putting a generational competence plan in place to identify and dispose of it, companies can use the differences between generations to develop and refine their competitive edge.

| **WA**

*Norm LeMay and Steven Kaufman are co-authors of the book The Garbage Man's Guide to Life: How to Get Out of the Dumps. If you'd like to see a video of this article, or if you'd like to download a free worksheet that can help your company kickstart its own generational competence plan, visit [www.GG-AGE.com](http://www.GG-AGE.com).*

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# Veolia Environmental Services Sees Dramatic Improvement in CSA Score with Zonar's Fleet Management System

**Veolia's Electronics Recycling Division cleans up with \$41,000 in ANNUAL SAVINGS.**

**FOR VEOLIA ENVIRONMENTAL SERVICES' OPERATING** groups, reducing waste is not only a key part of the company's mission, but also a key objective in the company's fleet operation. Veolia ES Technical Solutions is a division of Veolia Environment Services North America, which includes Veolia ES Industrial Services, L.L.C. The Technical Solutions group offers a complete range of hazardous and non-hazardous waste services through its nationwide network of service, treatment and transportation facilities. The group operates incineration, solvent recycling and electronics recycling services, and provides onsite services from a national footprint of locations.

Veolia's customers include pharmaceutical companies, chemical manufacturers, refineries, hospitals, universities and research laboratories. The division collects used lighting and electronic waste and transports it to processing facilities for recycling or disposal. Veolia's Electronics Recycling Division (ERD), based in Phoenix, AZ, operates a mixed fleet of 33 tractors with dry van, flatbed and tanker

trailers, maintained through a nationwide leasing program administered by Penske (Reading, PA). With equipment running in all of the Lower 48 states, ERD drivers or dispatchers call a toll-free number to schedule maintenance or arrange for assistance for emergency roadside service calls.

### Fleet Management System

To help the ERD operations, Zonar's (Seattle, WA) electronic fleet management system was adopted in 2010. The system includes an electronic vehicle inspection reporting (EVIR) solution for pre- and post-trip inspections and an onboard telematics platform. The telematics system captures data including fuel consumption, rate of travel, idle time and fault codes. The ERD monitors this data to manage driver performance and streamline the maintenance process.

Zonar's radio-frequency identification (RFID) tags are placed, just once, on the division's vehicles in critical inspection "zones." These weather tough tags contain information about their location on the vehicle, the components to be inspected and the identity of the vehicle or trailer. Using Zonar's 2010 inspection tool, Veolia drivers conduct their inspections by placing the reader within inches of each tag and indicating the condition of the components within the zone with one-handed, push-button responses. When a defect is discovered, the driver selects a description from a pre-defined list and indicates if the vehicle is safe to operate.

When the inspection is complete, drivers place the Zonar 2010 into the vehicle mount. The information is then transmitted to a secure database that ERD Fleet Manager Michael Bomgardner can readily access from any Web-browser via Zonar's Ground Traffic Control Web-based fleet management software. This provides Bomgardner with a real-time picture of fleet operations. "We have to improve and maintain good CSA scores in order to maintain our safety rating," he added. "If we lose our good safety rating, then we can't haul certain hazardous materials for Fortune 500 companies, and that's our bread and butter to make a living. We can't afford to have a cowboy out there driving a truck, getting us into trouble and jeopardizing our livelihood."



Photos courtesy of Zonar.

Michael Bomgardner, fleet manager of Electronics Recycling Division at Veolia Environmental Services, stands next to a container of recycled electrical transformers.

## Annual Savings and Improved Scores

As a result of using Zonar to identify and then repair mechanical problems earlier, the division realized \$41,000 in year-over-year savings, according to Bomgardner. Roadside service calls were reduced by 22 percent resulting in a savings of \$13,000 when compared to a 12-month period prior to Zonar's installation. The division also experienced a 13 percent reduction in the amount of time its vehicles spend in the maintenance shop, realizing annual savings of about \$28,000 as a result of improved maintenance shop efficiencies. Bomgardner's estimate of savings does not include Veolia driver downtime costs, which are based on \$85 per hour.

Veolia charges customers when drivers are detained. It's a fixed cost based in large part on how much Veolia pays drivers per mile, Bomgardner explained. That estimate also doesn't include the cost of roadside assistance or equipment that must be repaired or replaced to return the truck to service. Ultimately, reducing driver and vehicle downtime results in better on-time service to customers. This provides great value, but is difficult to quantify in terms of savings.

More important to the company than the savings are the significant improvements in the division's and company's scores under the Federal Motor Carrier Safety Administration's Compliance, Safety, Accountability (CSA) Program. Since adopting the Zonar system, the division's percentile scores in nearly all of CSA's seven categories were reduced by more than a third, which also contributed to the reduction of overall company scores, Bomgardner said. Under CSA, the lower the percentile score, the better. "By using Zonar and catching the problem before our truck leaves and fixing it, we're avoiding



Bomgardner shows a handheld unit that his company drivers use to conduct their inspection reports. The driver scans RFID tags placed at each inspection zone of the vehicle and indicates the status at each zone. The handheld device has a corresponding cradle mounted on the vehicle's dashboard or floorboard, which holds and charges the handheld unit when not in use.

having to pay a tremendous markup for whatever parts and pieces the roadside serviceman is going to sell us to fix our truck," he added.

Veolia also realizes savings through maintenance shop efficiencies because Penske can better respond to unscheduled maintenance issues. "If the check engine light comes on while the truck is out on the road, I'm going to see it at the same time or soon after the driver sees it on his dashboard," Bomgardner said. "Using Zonar, we can then determine whether it's a problem that needs to be addressed right away or if the driver can continue to finish his run. I

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## Veolia Environmental Services Sees Dramatic Improvement in CSA Score with Zonar's Fleet Management System



Zonar's electronic vehicle inspection reporting system employs this handheld unit that company drivers use to conduct their inspection reports. The driver scans RFID tags placed at each inspection zone of the vehicle and indicates the status at each zone. The handheld device has a corresponding cradle mounted on the vehicle's dashboard or floorboard, which holds and charges the handheld unit when not in use.

can then alert Penske that our truck is coming in and this is what the truck's sensors are telling us.

"In these kinds of situations, we're going to have downtime no matter what," he added. "Zonar gives us a heads up so we can minimize the effect on our operations by getting our trucks and drivers in and out of the shop faster and back on the road sooner."

### Protecting the Company

Another significant positive aspect of Zonar, Bomgardner said, is being able to produce hard-to-refute records that show, among other things, how fast the company's trucks are actually traveling when drivers are involved in accidents that are not their fault. From August of 2011 to August of 2012, Bomgardner said there have been three accidents in which he's been able to trace the path of the truck and clearly show what company drivers were doing. From a disciplinary standpoint, it cleared all three drivers from repercussions as far as the company was concerned, he added.

"The Zonar system protects our company and our drivers when they're involved in accidents by giving us the ability to show what happened," he said. "And that's how we sold it to our drivers, who were initially concerned about this 'Big Brother's watching you' aspect. I think our 31 drivers have really come to appreciate the need for this, particularly since we're a hazardous materials hauler." Bomgardner said the company is better prepared should its safety records ever get audited by State or Federal inspectors. Currently under CSA, all accidents count against the carrier and the driver, regardless of who's at fault.

Bomgardner said he's been a big proponent of CSA since it was introduced in late 2010 because it places equal responsibility for safety on the company and its drivers and because it makes driver behaviors and pre- and post-trip inspections more critical to running a safer operation. However, he realizes that the system could be a double-edged sword if it ever shows company drivers speeding or driving erratically. But since the Zonar system alerts him to vehicle speeds, it allows him to monitor driver behaviors and quickly identify potential problems and address them before they lead to accidents.

Zonar's onboard computer and EVIR make it easier for him to monitor and counsel drivers on their driving behaviors and for drivers to conduct their pre- and post-trip inspections correctly and more efficiently. "Because we're doing better pre-trip and post-trip inspections on our equipment we're catching more problems before they leave to go on the road and we're identifying potential problems and fixing them before we go out," Bomgardner added. "At the end of the day we're providing a better service for our customer and operating safer equipment on our highways."

### A Good Asset

Mike Bartholomew, director of special programs for Veolia ES Technical Solutions, said Veolia's customers are increasingly recognizing the importance of their carriers having a good and robust asset tracking and management program in place. As a result, the company has plans to expand the use of Zonar in more of its divisions. "Recently, we put together a major proposal for new business and on the application one of the questions specifically asked, 'do you have a GPS tracking system in place?'" Bartholomew said. "With some of the high-hazard materials we haul, safety and security are critical issues. Our customers need to know where our trucks are, and having the ability to track them using Zonar is a very important tool for our operation." | **WA**

For more information, contact Andrew Johnson, marketing director of Zonar, at (206) 878-2459 or via e-mail to [Andrew.johnson@zonarsystems.com](mailto:Andrew.johnson@zonarsystems.com).

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# Breakthroughs and Innovations



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- Analyze waste-related data to assess effectiveness of your program and make changes—schedule all waste-related activities to ensure the optimal frequency of waste pickup, treatment and disposal, allowing you to determine if frequency should be altered or haulers adjusted.
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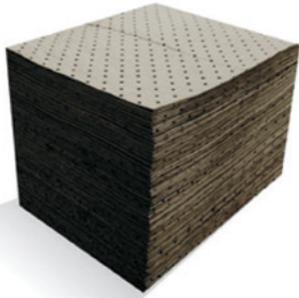
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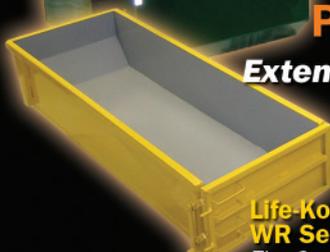


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*Waste Advantage Magazine's Recycling/Transfer Stations/Landfills (R/T/L) section has become a very important part of our readership. Our timely, relevant editorial in this section—products/services releases, statistics, short tips, etc.—provides you, our R/T/L professionals, with the useful information that you need when making that important purchasing decision. By making this important move, Waste Advantage Magazine, provides something for everyone in the waste and recycling industry and makes it the most complete one-stop-shop publication available today. We look forward to expanding our coverage of this segment of the industry and hearing your feedback.*

## Landfill Liners

# Smooth and Textured Polyethylene Geomembranes

Nathan Ivy

### THE LARGEST SEGMENT OF THE GEOMEMBRANE MARKET TODAY

is comprised of polyethylene geomembranes. Among polyethylene geomembrane resins, high-density polyethylene (HDPE) and linear low density polyethylene (LLDPE) are the two types most broadly available. HDPE is more widely used between these two due to its enhanced UV resistance, chemical resistance, durability and cost-effectiveness.

When polyethylene geomembranes were first introduced more than 30 years ago, only smooth surfaced geomembranes were available. However, as the need for increased slope stability was realized, the production of textured geomembranes was introduced to fill that need. The textured surface allows for increased interface strength against soils, textiles, geosynthetic clay liners (GCLs) and other critical interfaces.

### Textured Polyethylene Geomembranes Processes

Currently, there are three primary types of textured polyethylene geomembranes that are widely available. The two most commonly used methods in North America are co-extrusion (blown film) and structuring (calendared extrusion). Impingement is another method that was used in the U.S. in the 1990s, but is currently used primarily in Europe. These processes of manufacturing textured geomembranes have been in use for many years and have demonstrated largely acceptable performance in a variety of applications and slope conditions. All of these methods are available with texturing on one side or both sides, and in HDPE or LLDPE versions.

The industry recognized method for determining degree of texturing is ASTM D7466 – Standard Test Method for Measuring Asperity Height

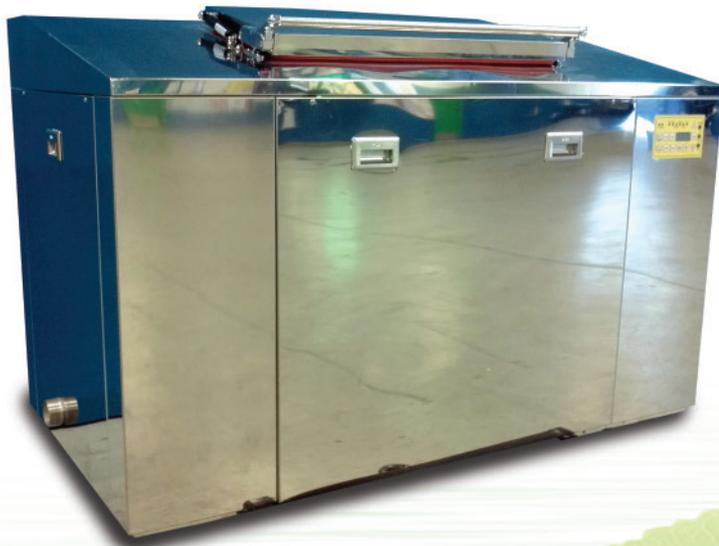


Smooth geomembrane (Agru America's Smooth Liner®) being used in a mining application. Smooth geomembrane is well suited for applications like this where the topography is flat. Because this pond will be left exposed, there are no concerns with cover soil on the side slope thus textured is not required. Photos courtesy of Agru America.

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Embossed textured geomembrane (Agru America's Microspike®) being installed on the cap of a solid waste landfill. Textured geomembrane is an integral part of the design for this type of application. The slopes are much taller and much steeper. In order for cover soil to remain in place, the geomembrane must be textured to develop greater friction between the soil and the geomembrane.

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of Textured Geomembrane. This test method measures the height from the core membrane to the top of the texture peak. This method requires that 10 randomly located samples across the roll width be tested, and does not allow for targeting specific areas that seem visually suspect and concentrating measurements there.

For the most part, all three processes result in a product with smooth edges to facilitate wedge welding of the membrane into panels in the field. Some manufacturers of co-extruded textured geomembranes produce a "smoother edge" where the texturing is flattened down resulting in a bumpy edge, which aids the welding operation although it is not truly smooth.

The co-extruded textured process entails injecting nitrogen gas into the molten plastic in the extruder. The screw in the extruder mixes the gas with the plastic. When the mixture leaves the die, the nitrogen expands to create a roughened surface on the geomembrane. This method produces acceptable texturing in most instances, but unfortunately, the exact geometry of the textured surface is uncontrolled. Therefore, this process may result in wide variation of textured quality from edge to edge, along the length of the

roll and from roll to roll within a specific project. This variation in texture quality may result in more shear testing being performed to ensure that the entire range of the manufacturing run exhibits an acceptable level of texture. An advantage of the co-extruded geomembrane is that the manufacturer can increase the amount of nitrogen in the mixture. This increased nitrogen results in higher asperity and in some cases, improved shear performance when compared to standard levels of nitrogen. These rolls are normally heavier and of larger diameter as additional polyethylene must be used to compensate for the increase in nitrogen. However, another concern regarding this process is that, depending on the amount of blowing agent in the mixture, the uncontrolled release of the excess nitrogen may result in the core thickness of the geomembrane to be unacceptably low. Another potential disadvantage of this method is that the textured surface created may exhibit a "hook and loop" or Velcro® effect when placed adjacent to a nonwoven geotextile or GCL, thereby requiring the use of a rub or slip sheet for deployment. This method allows rolls to be textured all the way to the edge or for smooth edges.

## Structuring or Patterning

A more recent innovation of textured geomembrane is referred to as structuring or patterning. Textured geomembrane manufactured in this way is extruded from a flat die immediately into patterned rollers. The membrane, which is still very hot at this point in the process, takes on the inverse pattern that has been embossed in the rollers. This process is ideal for ensuring uniformity of not only the texturing, but also the core geomembrane, across the entire width and the length of the roll. Because the textured pattern is specifically engineered, controlled and embossed in the rollers for the purpose of generating a textured geomembrane, the end user can be assured that there will be no variation in texture quality from side to side, along the length of the roll—or even from roll to roll for that matter. All textured rolls produced will look and perform the same. This also helps to eliminate guesswork and uncertainty when performing direct shear testing for a project. The engineer can be assured that a representative sample is truly representative of what the rest of the material will look like. Different rollers may be used to create more aggressive texturing such as those referred to as structured geomembranes. The ability to “mix and match” a variety of different rollers for each side of the geomembrane allows for a wide variety of applications and field conditions. As noted earlier, this material is flat cast. Because of this, the core thickness is fixed. In addition to uniform texture, there is also uniform core thickness over the entire roll, and there are no uncontrolled releases of blowing agent, which can impact the core thickness of the geomembrane resulting in thinner spots.

Another process by which geomembranes are textured is referred to as impingement. In this process, molten polyethylene is sprayed onto the smooth geomembrane in a secondary operation, and the texturing is not integral to the manufacture of the smooth geomembrane. This process is not widely used in North America due to the increased cost associated with a secondary manufacturing step. This method also allows for the edges to be blocked off from the spray leaving smooth edges which facilitate welding.

## Tensile Properties

Regardless of the type of texturing process that is used, tensile properties will be impacted as a result of the stress risers introduced on the surface of the geomembrane. Generally speaking, the effect of tensile properties as a result of texturing is most pronounced on the co-extruded textured geomembrane. The effect on tensile properties on structured or impingement geomembrane is evident, but much less dramatic. Co-extrusion may decrease tensile break elongation by as much as 85 percent. Impingement and structured textured geomembranes typically show a decrease of less than 50 percent. Other mechanical properties such as tear and puncture may be affected, but to a much lesser extent.

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While smooth geomembranes are acceptable for a variety of applications such as leach pads, floors of landfill cells or even wastewater ponds, there are numerous applications where textured geomembranes must be used to assure slope stability. In these instances it is always recommended to consult with your engineer as well as the geomembrane manufacturer(s) prior to making your final material selection. | WA

*Nathan Ivy is Technical/CSR Coordinator at Agru America, Inc. (Georgetown, SC). For more information, call (800) 373-2478 or e-mail [ads@agruamerica.com](mailto:ads@agruamerica.com).*



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**Recycling**

# The Efficiency of Pyrolysis



Vulcan Indirect Fired Thermal Desorption Unit. Photo courtesy of Worldwide Recycling Equipment Sales.

**AMERICANS DISPOSE OF ABOUT 300 MILLION WORN-OUT TIRES EACH**

year, and since tires are not biodegradable, they end up consuming a lot of space. Many states have prohibited the discarding of whole tires into landfills because, in addition to taking up extra room, buried tires in landfills collect air and methane and rise to the surface over time. Burning scrap tires release carcinogens and other poisons into the air, and the fires are difficult to extinguish and can often last for days or even weeks. Fortunately, scrap tires are recyclable, and through a process known as pyrolysis, they can be broken down into their original components, which can then be reused.

### The Pyrolysis Process

In the pyrolysis process, the whole or shredded tire is heated in a reactor vessel that contains an oxygen-free atmosphere. The rubber melts in the reactor, and the rubber polymers break down into smaller molecules, which eventually vaporize and exit the reactor. These vapors may then be burned to produce power or condensed into an oil-like liquid which can then be used as a fuel. The larger molecules that cannot be condensed remain as a gas, which is used to provide heat for the process.

The minerals and carbon that were part of the tire—about 40 percent by weight—are removed as a solid. The steel from the tire can be removed from the solid stream with magnets and can be recycled for reuse in industrial manufacturing. The remaining material is a carbonaceous char, which can be refined into carbon black. Carbon black is a substance that is used in the production of new tires and other rubber-related goods, as well as a fuel source for power generation or in cement kilns.

### Measuring the Benefits

When performed well, tire pyrolysis is a clean process with little to no emissions or waste. A 20-pound tire yields about 5 to 9 pounds of carbon, 1.5 to 2.5 gallons of fuel oil, more than 50,000 Btu's of gas and around 2 to 3 pounds of scrap steel. The process begins with weighing the tires. The tires are then introduced into the pyrolysis plant whole or shredded, halved

or chopped. Whether the tires are left whole or shredded depends on the type of plant used. Similarly, the length of time the process takes varies from unit to unit. Some units are batch, which means they process one group of tires completely before starting the next. Other units are continuous, providing a constant stream of product.

The resulting products can be recycled for reuse. The primary product of tire pyrolysis is tire oil, which many industries use as fuel. Carbon black, another product of pyrolysis, has multiple uses, including as a chemical strengthener in rubber and a coloring agent. There is a huge demand for carbon black in the rubber industry. The steel wire recycled from tires in pyrolysis can be sold as scrap.

The pyrolysis operation diverts waste tires from landfills and prevents them from potentially harming the environment. Unlike hazardous fires caused by waste tires, the pyrolysis process does not cause significant air pollution. The operation also produces materials that may be reused or sold, making tire pyrolysis a viable economic opportunity. | **WA**

*For more information, contact Worldwide Recycling Equipment Sales, LLC at (660) 263-7575 or [wwreq@wwreq.com](mailto:wwreq@wwreq.com).*

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## Landfills

# Mowing Vegetative Cover on a Closed Landfill Slope

Brian Lowe



The Tiger Prowler can operate on side slopes up to 50 degrees. Photos courtesy of Tiger Corporation.

**MOWING THE VEGETATIVE COVER ON A CLOSED LANDFILL CELL IS A VITAL** component in the ongoing post-closure plan, but it also presents a challenge to the authorities and the contractors that are tasked with executing the plan. Most modern cells are designed with slopes shallower than 3 to 1 (see Table 1) to minimize erosion from the elements. But older landfills and a demand for

increased cell capacity without an increase in the footprint mean that cells with steeper slopes are a reality. While the construction of these steeper side cells has its own challenges, the post-closure control of vegetation for any cell has their own concerns that will span the next several decades.

## Proper Control of Vegetation

Establishing a healthy vegetative cover is important for long term 'survival' of a capped cell by reducing the effects of the environment and the associated erosion concerns. However, the vegetation cover must be managed so roots from woody plants and saplings do not penetrate the cap and reach and damage the geo-membrane. Similarly, proper control of vegetation is deemed an important component of a brush fire risk reduction plan. As a result, most post-closure management programs recommend semi-annual mowing to encourage growth of beneficial ground covers while discouraging the establishment of damaging shrubs and trees. This is viewed as a best management practice that strikes an optimal balance between vegetation control and ongoing cost. As every site is different and depending upon native vegetation, more frequent mowing may be required. This in itself adds to the challenge and cost of mowing on slopes.

## Slope Problems

Even on the more gentle slopes, uneven settlement of the cell cover over the first few years following closure can produce localized areas that exceed the operating angles of common mowing equipment. Zero Turn Radius mowers (ZTRs) are frequently used in grass cover/vegetation control as they are fast, efficient, and common, making them cost effective. However, they generally

## MAINTAINING A LANDFILL IN IOWA



Following an unfortunate incident that resulted in an injury to an operator, an 1,800 acre landfill in Iowa\* needed a better way to maintain the vegetation growing on their site. Various mechanical means were tried, including tractors with dual tires and bat wing mowers, and ATV's equipped with tracks pulling a small mower. Each method had its drawback—tractors were large and heavy with a high center of gravity, and an ATV offered no protection to the operator. The need to look for a better way to maintain the steep slopes became a priority.

Having seen the remotely controlled Prowler® mower at a recent industry trade show, the management at the landfill called the local Tiger dealer, Mid Country Machinery, to demonstrate the Tiger Prowler on their own site and conditions. The demonstration showed that the Prowler was easy to operate and capable of negotiating the steep slopes and terraces that surround both the active and closed cells of the complex. Although the season has been unusually dry, the Prowler was able to maintain the vegetation that had grown since the previous control cycle to the management's satisfaction. In the spring of 2013 following a governing board's decision, a Prowler Slope-Pro was purchased. With experience operating a wide range of track based rolling stock, the Prowler was soon 'right at home' at the landfill. From a management perspective, the remotely controlled Prowler addresses many issues that all landfills face: it not only offers increased employee safety, it helps to control costs associated with equipment maintenance and repair and the ever present insurance risk.

*\*It is the policy of the landfill referenced that testimonials are not provided. Tiger Corporation respects their position. The landfill continues to use the Prowler Slope Pro since early this year to maintain their landfill.*

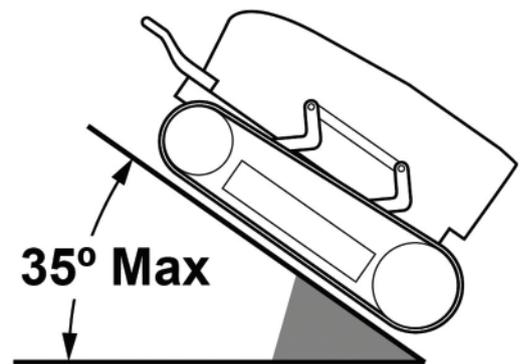
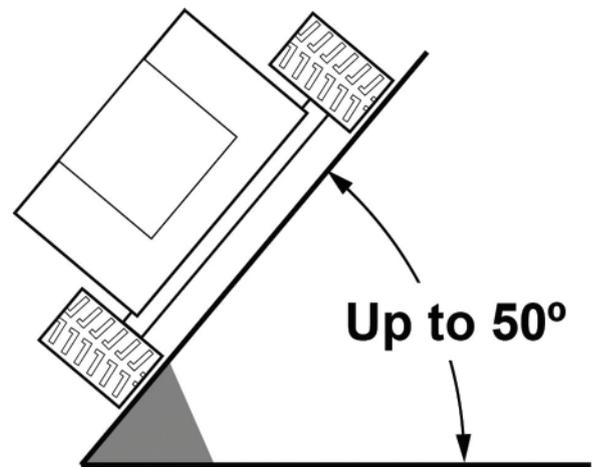
Degrees	Slope	Grade
5- deg	0.84 to 1	120%
45 deg	1 to 1	100%
26.6 deg	2 to 1	50%
1.4 deg	3 to 1	33%

**Table 1:** Cross reference chart of common slopes.

have a working angle limitation of 15° (or a slope of 3.7 to 1). If operated on steeper ground, the riding operator can be placed at risk for a roll-over, often with serious consequences. As most slopes are not uniform across the face, operating in an area perceived to be less than a 15° slope is no insurance against a rollover. Exacerbating the problem, people are generally very poor judges of an actual slope. Can you tell a 17° slope from one that is 10° or 22°? In a study conducted by U.S. Consumer Product Safety Commission, it was found that at least 42 percent of ZTR's are operated on slopes in excess of 15°. The same concerns holds true for a crew using string trimmers and clearing saws on slopes with overgrown vegetation. While the threat of equipment roll-over is removed, the risk of twisted ankles and other slip and fall injuries are very real. People do not perceive that this could be as hazardous as it is.

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maintaining landfills' slopes. A heavy duty, remote controlled, industrial mower is available that was designed for mowing slopes and other hazardous applications. At 2,600 pounds and a 52" wide cut, it can easily mow more than ¾ acres of sloped ground in just 1 hour and with only one person. Other considerations such as lower liability and workers' compensation insurance costs and a smaller crew factor into a low cost of operation.

With an operating radius of 300 feet, the remote controlled mower significantly reduces the manual labour hours previously required. Running on rubber tracks, the mower has a low center of gravity and is capable of operating on side slopes up to 50°, all without the need for external tie-offs or ground damaging steel spikes attached to the tracks. Making operations even easier, an operator simply can run the mower backwards rather than taking time to turn the unit around to make another pass.

But the main factor to highlight is that the operator is remotely positioned away from the mower. If a concealed washout is encountered or the ground suddenly gives way, the operator remains at a safe distance. The same holds true for natural hazards such as snakes and unseen bee hives hiding in the overgrowth. Keeping the operator at a safe distance from the mower is not possible with other means of mowing.

Regardless of the conditions at hand, the site's closure plan must be followed or partitioned to be changed. The latter is a daunting task in most cases so adapting to the stated vegetative control requirements is often the easier path. A remote controlled mower provides an additional tool to accomplish the plan.

**| WA**

For more information, contact **Dave Burkhart**, sales and marketing coordinator for Tiger Corporation (Sioux Falls, SD), at (800) 843-6849, via e-mail at [dburkhart@tigermowers.com](mailto:dburkhart@tigermowers.com) or visit [www.tigermowers.com](http://www.tigermowers.com).

## A CLOSED LANDFILL IN MASSACHUSETTS



A closed landfill in Massachusetts situated within a valley, issued a post closure maintenance contract for a 20 acre site with 30 degree sloped cell walls. As is standard design practice, the site has a berm or terrace of riprap to control erosion about every 75 yards and an extensive methane collection system. The slope of the terrace was gauged at 40 degrees and approximately 8 to 10 feet wide. The contract called for twice per year vegetation control with a cut height of 4" to 6". While these are common site conditions, it very difficult to use conventional mowing equipment or a boom mower effectively and safely. The company that was awarded the contract initially used a 73 HP diesel compact track loader with a 72" front mount mower and a tractor pulled 15' bat wing mower for the flat, open areas. Augmenting the mowers was a crew of several string trimmers. While it 'got the job done' the methodology took its toll on both equipment wear and tear and the retention of manpower as it was tough work.

In late 2012, the contractor added a 'Prowler' Slope-Pro® as part of his fleet. As with all new equipment, there was a learning curve in how to best utilize the Prowler and extract the highest productivity. To date it has shown great results in this application and has replaced the string trimmer crew as well as their associated costs. While the company is now 'smaller' the Prowler has also opened up new opportunities (and reduced expenses) at other sites the contractor maintains, such as dams and other riparian zones, where mechanical mowing was previously prevented or consider too hazardous.

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## Recycling Case Study

# Bin There, Done That: The Future of Increased Diversion is in the “Clear” Bag

**THERE’S A NEW BAG ON THE BLOCK AND IT SITS AT THE CURB WITHOUT A tag waiting for the collection truck.** Well, it’s not actually new, as it’s already spent a good deal of time in various parts of Atlantic Canada and Ontario. It’s the most effective and cost efficient diversion tool available—a clear plastic garbage bag.

For years now, our trade magazines have been filled with articles by industry experts that attempt to bedazzle us with the panacea for the successful diversion of residential waste is to simply put it in a nice shiny cart with wheels and roll it to the curb. How’s that working out anyway? Higher diversion?

Perhaps the approach to low diversion has been to require a “bag tag” and threaten to whack your residents financially if they fail to recycle. How did that work out? Or did it just make garbage a revenue stream for the municipality effectively putting the brakes on any further diversion efforts?

The sooner that we all face reality and realize that garbage collection and diversion from landfill is not rocket science and does not require millions of taxpayer dollars for large garbage containers, the sooner sanity will prevail, not to mention cost efficiencies.

## The City of Markham, ON Program Rollout

On April 30th, 2013, the City of Markham, ON (population 320,000) implemented a full scale rollout of a clear bag garbage collection program “Small Change – Big Benefit” for all residents (approximately 90K hhlds). With the new clear bag program, gone were ineffective bag limits, and bag tags. In its place was a simple democratic clear garbage bag program. The rules were

made simple—put out as much garbage as you need as long as it is in a clear plastic bag. A quick visual scan by collectors could confirm that the clear bags contained garbage—no recyclables or compostables. However, a limited number of smaller opaque kitchen catcher bags were allowed inside the large clear bag for unsightly or privacy items.

This process was evolutionary. Once the typical “start-up” resistance subsided, which took about four weeks, the mission was accomplished. The main issue from residents centered on what to do with their now redundant dark bags. Markham waste management staff promoted donating the dark bags to local charities and churches. In hind sight, a bag exchange program would have been helpful to ease the transition. A second unanticipated issue was the increased demand for more diversion tools. Blue boxes (curbside recycling) and green bins (organics diversion) flew out the door as the non recyclers realized the gig was up, they now had to separate their waste materials.

We are all aware of social marketing and the power of persuasion. As the program progressed, an unexpected result occurred—those who wouldn’t have recycled before, started keeping up. Failure to place garbage at the curb in a clear plastic bag was like putting a billboard on their lawn proclaiming “We don’t care about our Earth”. The old dark bags stood out for all to see.

Visibility of bag contents also improved collector safety substantially, now enabling the garbage collector to clearly see what he or she was about to pick up and minimize risk of injury. The City of Markham banned e-waste and household batteries from collection at the same time, in preparation for waste going to EFW.

Miller Waste collection vehicle with clear bag sign.



Photos courtesy of VisionQuest Environmental Strategies.



From left to right: Councillor Alan Ho, Councillor Don Hamilton, Deputy Mayor Jack Heath, Claudia Marsales, Councillor Colin Campbell, Councillor Alex Chiu, Councillor Carolina Moretti, MEAC Karl Lyew.

**Program Success**

Within 12 weeks of launching the clear bag garbage program, the cornerstone of “The Best of the Best” Markham’s Road to 80 percent Diversion—the City Waste Management Plan as approved by Markham Council in October 2012—the City of Markham surpassed their diversion target. Prior to April 2013, the City had already achieved an overall municipal diversion rate of 72 percent, which was pretty good by most standards. However, with the new clear bag garbage program in place, the overall diversion rate rose to 81 percent with 100 percent participation.

There was some major planning that went into this program including political and staff education, bylaw revisions and discussions with the waste collection contractor. Of significant importance and a major tactic that proved critical to achieving public acceptance included the need to interact with local retailers well in advance of the program launch to ensure that clear bags were available for residents in advance of the program launch.

Early on, Markham officials recognized the importance of engaging a professional retail consultant, VisionQuest Environmental Strategies (Aurora, ON), who knew how to navigate the complexities of the retail industry and get to the right people to ensure that local retail shelf offering plan-o-grams were adjusted, and the bags were on the store shelves.

Perhaps most importantly, attaining higher diversion in the City of Markham did not increase collection or residents costs. Clear bags are the same price as dark bags. Officials recognized that they may not be the first municipality in North America to launch a clear bag garbage collection program, however, through their experiences and diversion accomplishments they certainly don’t expect to be the last. Clearly, lessons have been learned. Sorry Binny, your better days may be behind you. | **WA**

*Claudia Marsales is Senior Manager of Solid Waste for the City of Markham. Claudia was worked on diversion programs since 1986 with both the public and private sectors. She can be reached at cmarsales@markham.ca.*

*Dave Douglas is President of VisionQuest Environmental Strategies Corp. Dave has worked in the North American solid waste management industry (public and private sector) since 1988 focusing on waste management/diversion strategies, e-waste diversion, centralized composting, green roof, zero waste and corporate stewardship/extended producer responsibility/stewardship compliance. He can be reached at (416) 570-4379, via e-mail at VisionQuestESC@sympatico.ca or visit www.VisionQuestEnvironmental.com.*

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For a bigger workload, a 50' Vulcan Indirect Fired Thermal Desorption Unit is a continuous feed system that is able to process up to 10 tons of tires per hour. This unit is custom-built for tire pyrolysis, and its kiln is an externally heated, rotating COR-TEN steel cylinder. The system drills the tires in an oxygen-deficient environment, where the tire chips are heated without burning to extract high quality oil, gas, carbon and steel.

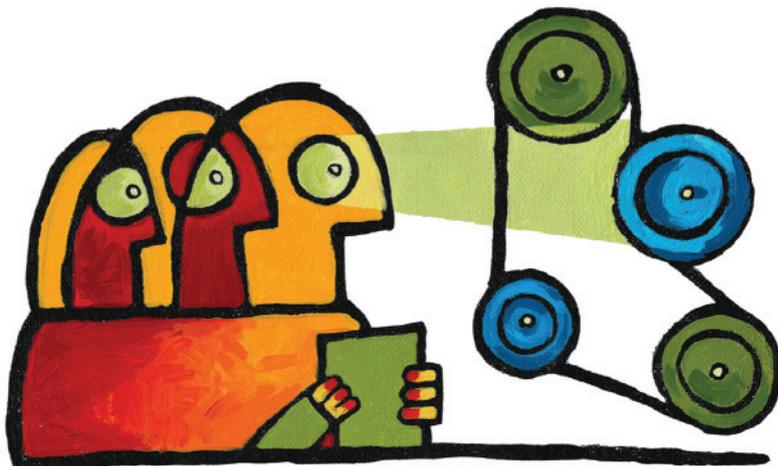
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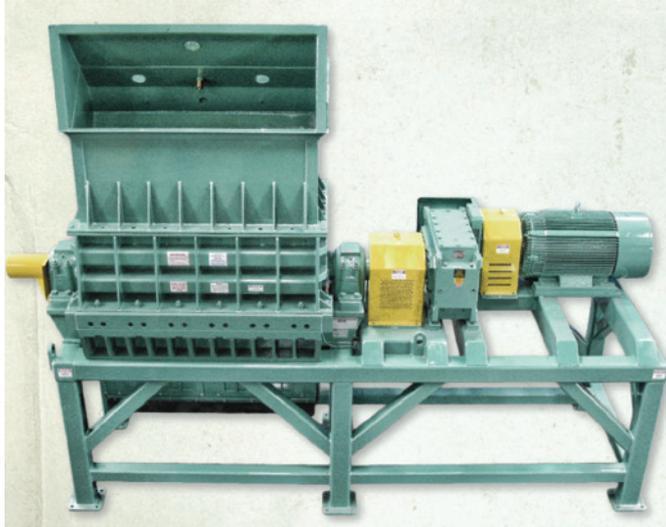
To purchase this standard, or any of the ANSI Z245 standards, please visit [www.WASTEC.org](http://www.WASTEC.org), go to the Publications/Resources tab, and click on the EIA store.



### VISIONQUEST ENVIRONMENTAL

**STRATEGIES CORP. (Aurora, ON)** offers a network gateway into the North American solid waste and recycling arena including a plethora of governmental and industry professional contacts that are key to establishing business development through strategic partnerships. They possess a solid technical competence across the broad and complex spectrum of solid waste management issues ranging from collection and processing efficiencies, commodity markets and downstream demand, e-waste diversion, corporate extended producer responsibility (EPR) regulations, zero waste Initiatives and environmental design (ie, green roof). Not only is VisionQuest deeply involved with the mainstream trends of today but they are involved in the design and implementation of innovative waste diversions strategies of tomorrow.

FOR MORE INFORMATION, CONTACT DAVE DOUGLAS AT (416) 570-4379 OR E-MAIL [VISIONQUESTESC@SYMPATICO.CA](mailto:VISIONQUESTESC@SYMPATICO.CA).



The Saturn Grizzly Super 80 by GRANUTECH-SATURN SYSTEMS (Grand Prairie, TX) is a world class, medium speed grinder that provides efficient, high performance size reduction for processing industrial scrap. It uses state-of-the-art single rotor design and application configurable screens for exact size reduction. By producing smaller, more consistent material, the Saturn Grizzly Super 80 improves the performance of downstream equipment or can replace it entirely. Some applications include processing tires, waste-to-energy, biomass, cable scrap and plastics. Features are:

- Available screen sizes from ½" minus to 1-inch minus or larger
- Housing lined with replaceable wear-plates
- 34" diameter rotor supported by double-row spherical roller bearings
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The McMRF™ from CP MANUFACTURING (San Diego, CA) was well-known in the industry. Decades ago, when the McMRF was originally introduced, it processed only co-mingled materials. The CP Group has re-engineered the system for single-stream materials, realizing the need for smaller sort systems in small communities that do not need a full-scale system, and still receive the benefits of a larger system, high-quality machinery, recover rates and material quality.

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