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www.wasteadvantagemag.com July 2012 Vol.3, No.7

# WasteAdvantage

The Advantage in the Waste Industry

## R & S WASTE SYSTEMS: KEEPING THE RIGHT ATTITUDE

Waste-to-Energy and the Three "E"s:  
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Development and Environmental  
Stewardship

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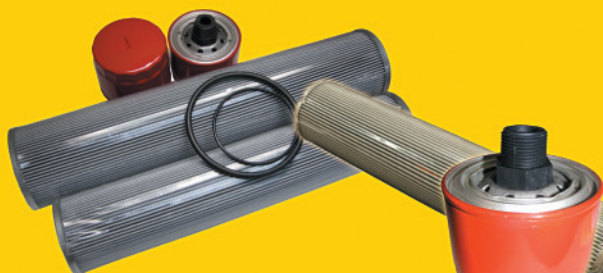


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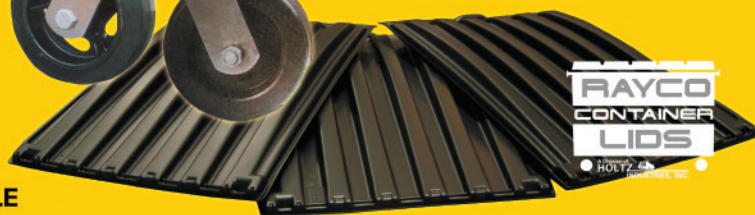
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## Editor's Note



### AS PART OF MY JOB FOR WASTE ADVANTAGE MAGAZINE, I GET TO ATTEND

great conferences that discuss the future of waste conversion. Just recently, I was able to go to the Waste Conversion Congress East Coast that took place in Philadelphia, PA from June 12 – 13. Now in its second year and boasting some of the waste industry's most prominent figures, this conference highlighted not only the technologies and processes involved in waste conversion, but also offered best practices and strategies from national organizations, such as the Energy Recovery Council, the BioEnergy Producers Association and EPA's Office of Solid Waste and Emergency Response. Brian Staley, Executive Director of the Environmental Research and Education Foundation, made the opening remarks and then kicked off the presentation and panels to Harvey Gershman, president of GBB, giving an overview of the waste conversion technologies and strategies. Panels covered topics from gasification and landfill technologies to waste-to-biofuels and anaerobic digestion. Other presentations included discussions on waste regulatory developments, navigating funding options and the regulatory landscape, investment strategies and public-private partnerships. Networking lunches on both days provided a great opportunity for industry colleagues to meet with each other and exchange contact information as well as ideas about what are the next steps in waste to energy. I had the opportunity to meet a few great people who were enthusiastic about the upcoming changes and were eager to share what they thought and what they would like to see. All-in-all, those who attended the conference walked away with some valuable information about the beginning of the process to implementation and the possible cost savings and benefits. New technology processes were discussed and contacts made as another successful waste conversion technology congress closed in Philadelphia.\*



This month's issue has a great profile on R & S Waste Systems (page 14), based in Defiance, IA, who has stayed connected with the community and their customers by getting involved in local organizations in their area, all while facing industry challenges head on. "Waste-to-Energy and the Three "E"s discusses the option of tapping into public-private partnerships in order to turn waste streams into low-cost power (page 19) while "Rethinking Capital Equipment Investments for Multi-Generation Products" (page 23) talks about thinking beyond today's solution and making sure that your supplier will support you when changes are made. We look forward to meeting with you next month at WASTECON in Washington, DC. Feel free to contact me with any comment or questions.

Best Regards,  
Angelina Ruiz, Editorial Director

*\*Read an extended version of the Waste Conversion Technology Congress East wrap-up on [www.wasteadvantagemag.com](http://www.wasteadvantagemag.com).*

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The Advantage in the Waste Industry

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*Waste Advantage Magazine* (ISSN # 2150-8429) is published 12 times per year, January, February, March, April, May, June, July, August, September, October, November and December.

A controlled circulation publication, *Waste Advantage Magazine* is distributed without charge to 25,000 qualified subscribers in the United States and Canada. Non-qualified subscription rates in the United States and Canada: \$48.00 per year. All other countries: \$200.00 per year payable in U.S. funds. Single copies \$15.00 per issue in the United States and Canada. All other countries \$18.00 per issue.

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Editorial contributions are accepted from the waste industry. Contact the editor for details. Product/service information should be submitted in accordance with guidelines available from the editor. Advertising close is 30 days prior to the month of publication.

CHANGE OF ADDRESS REQUESTS MAIL TO:  
Waste Advantage Magazine, Attn: Circulation,  
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R & S Waste employee picking up residential trash.

Photo courtesy of R & S Waste Systems, Inc. (Defiance, IA)

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The place for ONE-STOP-SHOPPING TO FIND ANY EQUIPMENT to fit your needs. Turn to this featured section to discover who is selling what in the solid waste industry today.

Photos courtesy of Tealinc., USON and Maria Kelleher.







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## Clean Truckin' in Charlotte

The world's leading fleets and manufacturers will gather at the Charlotte Convention Center (NC) for the **HYBRID, ELECTRIC AND ADVANCED TRUCK USERS FORUM CONFERENCE & EXPO (HTUF)** from September 18 – 20, focusing on expanding commercial and military fleet knowledge of clean, fuel-saving trucks and buses now built in the U.S., including advanced hybrid and electric vehicles. "This year's HTUF conference will offer specific, concrete pathways forward to a clean truck future, with the unveiling of a groundbreaking national roadmap," said John Boesel, CALSTART CEO and President. "A clear path forward is critical for American energy security and economic stability, as our nation's commercial fleets continue to be buffeted by fluctuating energy prices. It's even more critical for our nation's troops, as more efficient movement of soldiers and equipment is proven to save lives."

Annually, the conference draws hundreds of attendees representing fleets, truck makers, technology leaders, and military and government officials. Attendees are able to kick the tires of the world's most advanced medium- and heavy-duty vehicles available today, take an active role in growing clean tech jobs and reduce petroleum consumption in the U.S. attendees will be treated to a taste of NASCAR with a gala reception at the NASCAR Hall of Fame, and the opportunity to drive these advanced vehicles on a professional speedway track at Charlotte's zMax Dragstrip.

*For more information or to register for the event, visit [www.htuf2012.org](http://www.htuf2012.org).*

## Enerkem Begins Ethanol Production from Waste at its Demonstration Facility in Westbury, QC

**ENERKEM INC.** (Montreal, QC), a waste-to-biofuels and chemicals company,

announces the initial production of cellulosic ethanol from waste materials at its demonstration facility in Westbury, QC. "The start of ethanol production at our Westbury facility is a significant milestone," said Vincent Chornet, President and CEO. "Enerkem has already produced cellulosic ethanol at its smaller scale pilot laboratory facility in Sherbrooke. This new achievement in Westbury allows us to confirm the process design of our proprietary methanol-to-ethanol technology for its deployment at Enerkem's full-scale commercial plants in Edmonton and other locations." The newly installed equipment for the conversion of Enerkem's methanol into cellulosic ethanol is now used in combination with the larger methanol equipment already in operation at Westbury.

*For more information, call (514) 875-0284 or visit [www.enerkem.com](http://www.enerkem.com).*

## Robert Vogal Now National Sales Manager for Lubecore Automated Lubrication Systems

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## The CP Group Introduces New Logo

The **CP GROUP** (San Diego, CA) introduces the release of their new logo. The CP Group entity was formed in 2003 when CP Manufacturing acquired MSS. Since then, Krause Manufacturing, IPS Balers and Advanced MRF have joined the CP Group team, under common ownership.

The new logo was created to represent the five companies of the CP Group as a strong, single entity, as the CP Group continues to grow and offer technologically advanced material recovery facilities and recycling equipment.

Ashley Davis, Marketing Manager of the CP Group says, "We are very excited about the release of our new logo. If you look closely, you will see the symbolic meaning behind it—a blue planet with a green movement orbiting around the CP Group."

Davis continues, "The CP Group is committed to, and has been for several decades, proactively watching market trends to develop and offer the most innovative technology and equipment to ensure our customers success. Our new logo represents our growth and strength as a Group."

*For more information, call (619) 477-3175 or visit [www.theCPgrp.com](http://www.theCPgrp.com).*





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## JULY 2012

### 25 – 27: Pennsylvania State Recycling Association's 22nd Annual Conference

Lancaster Convention Center  
Lancaster, PA  
[www.proprecycles.org](http://www.proprecycles.org)

## AUGUST 2012

### 14 – 16: WASTECON 2012

Gaylord National Resort and Convention Center  
Washington, DC  
[www.wastecon.org](http://www.wastecon.org)

### 23 – 25: Florida League of Cities' 86th Annual Conference

Westin Diplomat  
Hollywood, FL  
[www.floridaleagueofcities.com](http://www.floridaleagueofcities.com)

### 26 – 29: APWA International Public Works Congress & Exposition

Anaheim Convention Center  
Anaheim, CA  
[www.apwa.net](http://www.apwa.net)

### 28 – 29: Resource Recycling Conference

Hilton Austin  
Austin, TX  
[www.resource-recycling.com/rr\\_conference/index.html](http://www.resource-recycling.com/rr_conference/index.html)

## SEPTEMBER 2012

### 11 – 12: 2012 NSWMA Southeast Annual Conference

Renaissance World Golf Village Resort  
St. Augustine, FL  
[www.environmentalistseveryday.org](http://www.environmentalistseveryday.org)

### 16 – 18: Waste-to-Fuels Conference & Trade Show

The Mystic Marriott Hotel & Spa  
Mystic, CT  
[www.waste-to-fuels.org](http://www.waste-to-fuels.org)

### 17 – 19: The IWSA World Solid Waste Congress 2012

Palazzo dei Congressi  
Florence, Italy  
[www.iswa2012.org](http://www.iswa2012.org)

### 18 – 19: 2012 NSWMA Heartland Annual Conference

Quartz Mountain Resort  
Lone Wolf, OK  
[www.environmentalistseveryday.org](http://www.environmentalistseveryday.org)

### 18 – 20: Hybrid, Electric and Advanced Truck Users Forum (HTUF) 2012

Charlotte Convention Center  
Charlotte, NC  
[www.htuf2012.org](http://www.htuf2012.org)

### 25 – 26: 2012 NSWMA South Central Annual Conference

Hyatt Regency Hill Country Resort  
San Antonio, TX  
[www.environmentalistseveryday.org](http://www.environmentalistseveryday.org)

### 30 – October 3: 2012 Global Waste Management Symposium

Arizona Grand Resort  
Phoenix, AZ  
[www.wastesymposium.com](http://www.wastesymposium.com)

## OCTOBER 2012

### 1 – 3: 2012 Iowa Recycling and Solid Waste Management Conference

Coralville, IA  
[www.iowaconference.org](http://www.iowaconference.org)

### 2 – 3: 2012 NSWMA Mid-Atlantic Annual Conference

The Homestead  
Hot Springs, VA  
[www.environmentalistseveryday.org](http://www.environmentalistseveryday.org)

### 15 – 17: Executive Roundtable Conference 2012

The Ritz-Carlton, Laguna Niguel  
Dana Point, CA  
[www.environmentalistseveryday.org](http://www.environmentalistseveryday.org)

### 19 – 21: 1st Annual World Congress of Greentech

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[www.bitcongress.com/Greentech2012](http://www.bitcongress.com/Greentech2012)

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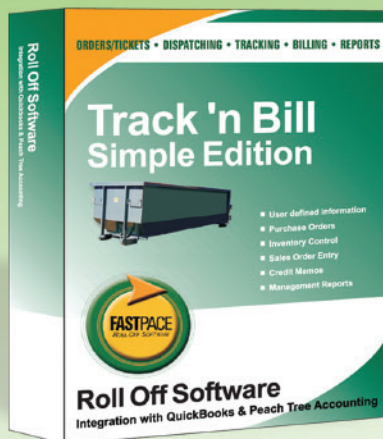


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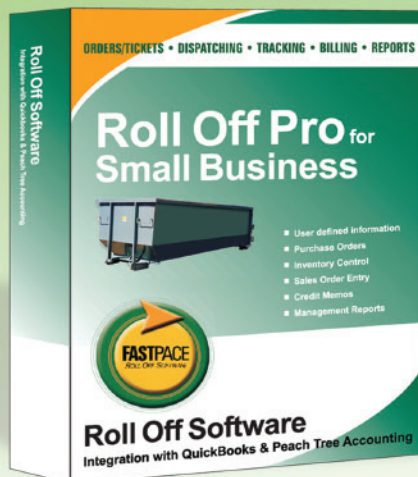


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## SWANA Calls for a Permanent Exemption for Biogenic CO<sub>2</sub> Emissions for MSW Management Activities

SWANA requested that EPA's Scientific Advisory Board (SAB) support a categorical exclusion for biogenic CO<sub>2</sub> emissions from management of municipal solid waste from the Prevention of Significant Deterioration and Title V GHG Tailoring Rule. SWANA believes that this exemption should apply to biogenic CO<sub>2</sub> generated from the combustion of landfill gas and from waste-to-energy facilities. SWANA called for this exemption in May 18 comments submitted in response to the SAB Review of EPA's Draft Accounting Framework for Biogenic CO<sub>2</sub> Emissions from Stationary Sources. In support of this exemption, SWANA described the very significant reductions of greenhouse gas emissions from solid waste management activities over the past several decades. Since the 1970s, greenhouse gas emissions from this sector have been reduced by 75 percent while total generation of solid waste has more than doubled.

The SAB recommended that EPA consider identifying those feedstock categories for which the biogenic accounting framework (BAF) would automatically be set to zero. SWANA agrees with this recommendation and notes that the use of waste as a fuel source is widely accepted as carbon neutral and actually reduces greenhouse gas emissions on a lifecycle basis. SWANA believes that the landfill gas combustion category warrants an automatic BAF of zero, given the extensive life cycle analyses already conducted by EPA. For waste-to-energy, the panel recommended that EPA should take into account the mix of biogenic and fossil carbon when waste is combusted and SWANA agrees with this recommendation.

The SAB also recommended that for landfill gas combustion, EPA should incorporate emissions and partial capture of methane from landfills. SWANA disagrees with this recommendation and believes there is no scientific or policy basis for regulating biogenic CO<sub>2</sub> emissions based on methane collection efficiency, which has no impact on CO<sub>2</sub> emissions from landfills. SWANA also recommended that the EPA Framework account for carbon sequestration of municipal solid waste disposed in landfills. Carbon sequestration is quantifiable; the biological process is well understood and described in Agency documents and peer-reviewed scientific literature, and its offsetting effects are easily assigned at the facility level.

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

## IARC: Diesel Engine Exhaust Carcinogenic

After a week-long meeting of international experts, the International Agency for Research on Cancer (IARC), which is part of the World Health Organization (WHO), classified diesel engine exhaust as carcinogenic to humans, based on sufficient evidence that exposure is associated with an increased risk for lung cancer. There has been mounting concern about the cancer-causing potential of diesel exhaust, particularly based on findings in epidemiological studies of workers exposed in various settings. This was re-emphasized by the publication in March 2012 of the results of a large U.S. National Cancer Institute/National Institute for Occupational Safety and Health study of occupational exposure to such emissions in underground miners, which showed an increased risk of death from lung cancer in exposed workers.

Given the Working Group's rigorous, independent assessment of the science, governments and other decision-makers have a valuable evidence-base on which to consider environmental standards for diesel exhaust emissions and to continue to work with the engine and fuel manufacturers towards those goals. Increasing environmental concerns over the past two decades have resulted in regulatory action in North America, Europe and elsewhere with successively tighter emission standards for both diesel and gasoline engines. For diesel engines, this means required changes in the fuel, such as marked decreases in sulfur content, changes in engine design to burn diesel fuel more efficiently and reductions in emissions through exhaust control technology.

Dr. Christopher Portier, Chairman of the IARC working Group, stated that, "The scientific evidence was compelling and the Working Group's conclusion was unanimous: diesel engine exhaust causes lung cancer in humans." Dr. Portier continued: "Given the additional health impacts from diesel particulates, exposure to this mixture of chemicals should be reduced worldwide."

*For more information, visit [www.iarc.fr](http://www.iarc.fr).*

## EPA Launches First Waste to Biogas Mapping Tool

EPA's Pacific Southwest Region has launched an online "waste-to-biogas mapping tool" to support the use of organic waste for energy projects. The tool is an interactive map created to link food and other biodegradable waste sources with facilities such as wastewater treatment plants that can enhance energy production with their existing infrastructure. Wastewater treatment plants and some dairies manage waste with anaerobic digesters, which produce methane-rich biogas as a natural byproduct. By adding food scraps or fats, oils, and grease to an anaerobic digester, facilities can increase biogas production to make money while providing a renewable energy source, reducing greenhouse gas emissions. These business and environmental opportunities may present a largely unrealized potential. The tool is designed for decision-makers with technical expertise in the fields of waste management, wastewater treatment, and renewable energy. This includes businesses, state and local governments, and non-profits. The tool allows users to determine the types of facilities in their area, where clusters are located, and the distance between a waste producer and an anaerobic digester. The tool also functions in reverse—allowing generators of organic waste to find partner facilities that will accept it.

*The Mapping Tool is Found at [www.epa.gov/region9/biogas](http://www.epa.gov/region9/biogas).*

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# R & S Waste Systems: Keeping the Right Attitude

**With more than 35 years of business under their belt, R & S Waste Systems not only STAYS CONNECTED WITH THEIR CUSTOMERS AND COMMUNITIES SERVED, BUT THEY ALSO MAINTAIN A PROACTIVE STANCE WHEN FACED WITH INDUSTRY CHALLENGES.**

### **R & S WASTE SYSTEMS, INC. WAS ESTABLISHED**

on October 1, 1976 in Defiance, IA by Ron and Sally Weihs. When the couple was first married, they initially wanted to get into farming since that was what Ron Weihs grew up doing. However, with farmland at astronomical prices and extremely high interest rates to borrow money for equipment, the option just was not feasible. At the same time, a local trash hauler had to sell his small route and since the Weihs' were looking for a business, they decided to purchase it. Beginning with four small towns in southwestern Iowa, over the years they have gradually added more, including many additional rural customers, compactor services, roll-off services, tipper carts, onsite storage containers, curbside recycling and drop-site recycling services. With a staff of 10 employees and a fleet of eight vehicles, R & S Waste now serves the counties of Shelby, Pottawattamie, Harrison and Crawford in southwest Iowa. Covering approximately a 75-mile radius of their hometown of Defiance by dealing with non-hazardous commercial and residential

solid waste as well as recyclables, R & S Waste serves about 3,000 residential and 800 commercial accounts, plus the roll-off business that varies from day to day.

### **Taking a Proactive Stance**

According to Ron Weihs, R & S Waste's President and founding owner, the economy has not really affected their organization since the rural areas that depend on agriculture are currently doing pretty well. "We try to be proactive in providing service that our customers want such as varying schedules, i.e. every other week, monthly or weekly service depending on their needs," he says. R & S Waste also puts together a newsletter called *Trash Talk*, which is mailed out with customers' billing statements in the spring and late fall. The newsletter informs them about the different items that R & S Waste deals with such as what to do with hazardous waste, electronic waste, etc. R & S Waste also maintains a company Web site with information on the service territory, the holidays observed, different services

R & S Waste Systems, Inc. fleet.  
Photos courtesy of R & S Waste Systems.





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Ron Weihs picking up tipper carts.

offered, how to handle special waste items, recycling information, how to pack a storage container securely for moving and recycling videos on how to “do it right.” Customers can also make payments on their accounts and there are past articles from newspapers and magazines about the business to view as well.

Weihs points out that he is particularly proud of the company’s growth and their focus on customer service. When a customer signs up for non-weekly service, a welcome letter, a notice of what can be picked up, a payment information sheet, a yearly pickup schedule calendar, R & S Waste preprinted mailing labels and small stickers are sent out. Those with weekly or multiple weekly services get a welcome letter with everything but the calendar. Each December, the company sends out a new yearly calendar and the small stickers for customers to put on their own calendars as a reminder. “These calendars are very popular with customers and save a lot of phone calls to the office for scheduling questions,” says Weihs. In addition, all types of payment options are offered to customers for their convenience. For example, they can have their monthly charge automatically debited or charged to a credit card each month, make an online payment on the Web site or phone it in.

R & S Waste supports many of the local clubs and organizations in the towns they serve—fire departments, schools, churches and civic organizations—through cash donations and buying advertising for their events. They also belong to many of the small towns’ chambers of commerce and business organizations. The company has their own big projects going on as well, such as the books Weihs’ wife and co-owner, Vice President, Sally Weihs, has written. “Living in a small town, Ron and I have always been very active in the community, serving on many civic and church organizations,” she says. “Now, I am busy with book readings for the local schools and libraries.”

Sally Weihs explains, “When our company celebrated 25 years in business in 2001, I wrote and put together a cookbook entitled *You Eat the Best, We Take the Rest*. The book contained more than 800 recipes that were collected from our customers and family members. We sold more than 600 copies of that book and raised a little over \$8,000, which was divided up among the four county food banks in our area.” For her second book, Sally Weihs wrote a children’s story focusing on recycling. *Big Blue Goes Green* debuted in April 2012 and tells the story of a garbage truck named Big Blue who learns a valuable lesson in what it means to go green. While at the landfill Big Blue meets a new friend, Rita Recycler, who teaches him how to lighten his loads through recycling. This book’s proceeds will go to Teen Challenge of the Midlands, a program that focuses on drug and alcohol addiction. “Garbage and recycling are what I know,” says Sally Weihs. “R & S Waste has been instrumental in setting up several recycling programs for our customers and it seems like there is never enough education. Kids are sponges for learning and it is never too early to start them doing it right” (see *Big Blue Goes Green: An Interview with Author, Sally Weihs sidebar*, page 18).

## Training and Safety

R & S Waste keeps up with safety by holding safety meetings once a week to talk about issues like children at play in the summer, the icy road conditions in the winter, watching for overhead wires, safety getting on and off the truck, and other important topics. High visibility uniform shirts and leather gloves supplied by the company must be worn and all of the trucks are equipped with backup cameras. R & S Waste also has an employee handbook that states what the appropriate conduct and behavior expected of their employees and, of course, all employees are subject to drug testing.



## Facing Challenges Head On

Weihs stresses that the weather is always a challenging factor in their part of the country, especially when they faced three major blizzards a couple of years ago. "It was the first time in our history that we did not get out at all. That was a tough time. The towns and cities were taken care of as soon as we were able to get out and about and the other rural stops were just caught up over the next several days. We ended up running routes on Sunday in order to catch up."

Another challenge for R & S Waste has been fires in their trucks. They have already lost two of them due to fires in the packers of the trucks because of negligence from customers throwing away hot embers. In order to educate customers on this hazard, an information flyer is sent out that specifically states the policy on hot ashes and embers, and the company runs ads in the local papers to educate people on the dangers. They also have had to deal with an electrical fire in the company's shop that led to a truck burning and major damage to the office and shop. Ultimately, it took seven months to repair the building and get a new truck replacement. During that time, R & S Waste rented a small office in town and rented a garbage truck from an equipment rental company to get by. "We do the best we can and move on," stresses Weihs.

Right now, R & S Waste is dealing with the high cost of fuel and insurance costs, which Weihs believes is one of the waste industry's main challenges as



R & S Waste worker pickup up house-to-house recycling.

well. "These two items are escalating faster than any other cost that we deal with," says Weihs. "We have had to raise our fees to cover the additional cost of fuel and are continually optimizing our routes to be more efficient, but we have never implemented a fuel surcharge. We are also contracting fuel for six months at a time so we know what the costs are going forward." Currently, R & S Waste has no plans to change over to alternative fueled trucks because of the cost and because the fuel infrastructure isn't in place at this time in their area.

Even though R & S Waste has not had an insurance claim for many years,

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## BIG BLUE GOES GREEN

### An Interview with Author, Sally Weihs

**What inspired you to write this children's book?** I have always liked to write short stories. Children are fascinated with garbage trucks, especially little boys. After looking

at other children's books on recycling, I decided it would be fun to write an educational yet fun book about it. We have five grandchildren who love to read, so it was a logical choice.

**Where there any particular inspirations that you drew from during the writing process?** Garbage and recycling are what I know. We have been instrumental in setting up several recycling programs for our customers and it seems like there is never enough education. Kids are sponges for learning and it is never too early to start them doing it right.

**How long did it take you to write this book?** It took me about a half hour to write the story, but the process from start to finish took about nine months. It wouldn't have taken that long if it were not for my regular job of helping my husband run our business. Initially, this book was to be in conjunction with our R & S Waste's 35th anniversary, but I didn't make my October 1, 2011 deadline—life



happens. Also, the artist, Ryan McCoy, who is my nephew, was still in college plus working a couple of jobs so it was process. I took pictures of our trucks from all angles and e-mailed them to him. From there, he made them into cartoon characters. I would tell him what I had in mind on each page of the book and we e-mailed ideas back and forth. He did a beautiful job.

**What made you decide to donate the proceeds to Teen Challenge of the Midlands?** I was looking for a charity that was run on charitable donations that did not receive any government aid. Drug and alcohol addiction are devastating to families and is something that does not just affect any one area in the U.S. or just any social or economic sector. Their program is faith-based, which was also a main factor for me. I believe that we all need to have God in our lives. After speaking with Pastor Hunsberger in Des Moines about their program, I decided that Teen Challenge of the Midlands was the charity for my project. My initial goal is to sell at least 1,000 copies of my book in order to be able to give a decent sized donation to Teen Challenge. The book will always be out there for sale. It has an ISBN number and is listed with the Library of Congress so proceeds will always be given to Teen Challenge.

**What kind of marketing strategies have you used to get the word out about your book?** I have contacted the local newspapers who have done nice articles on the book. We also went to the Waste Expo this year in Las Vegas and took orders there. I have contacted a few of the national magazines, such as *Waste Advantage Magazine*. I have a huge list of names of businesses and publications that I will contact little by little. Since I am self-employed I didn't want to be overwhelmed with too many obligations all at once. I have had a couple of book readings and book signings and this fall and I am going to contact the schools to see if they would be interested in the book. I also plan to donate a few of the books to local libraries.

**Will you be planning a follow up waste/recycling book in the future?** I have thought about having a follow up book about an adventure with Big Blue and Rita Recycler but it probably would not happen for a few years.

To order a copy of *Big Blue Goes Green*, call (712) 748-3471, e-mail [bigblue@fmctc.com](mailto:bigblue@fmctc.com) or visit [www.authorhouse.com](http://www.authorhouse.com).

Weihs points out that the solid waste and recycling business is considered to be high risk which, in turn, makes the rate for worker's compensation high. "Many of the businesses that we deal with require waivers of subrogation and high limit liability insurance, which is very expensive," says Weihs.

### Growing the Company

Weihs intends to keep R & S Waste growing by becoming more automated through using tipper carts, eventually going to automated sideloader trucks and developing continual marketing strategies to keep their business name out in the surrounding communities. "Our theory has always been to grow slowly, which we are still doing," says Weihs. "We send out marketing flyers to different areas we serve to inform people that we would love to provide them with trash removal service. We also advertise on the radio. However, probably

our best advertisement is our logo, which is a plain bright blue sign with the name R & S Waste Systems and phone number on it. It is a very clean simple design. We have them on everything and people often comment that they see our blue stickers on containers everywhere."

Sally Weihs agrees, "The solid waste industry has been our life for more than 35 years now. Ron and I are truly dedicated to continually put our customers first and believe that we have been an integral part of improving the environment." | **WA**

For more information on R & S Waste Systems, call (712) 748-3471, e-mail [admin@rswaste.com](mailto:admin@rswaste.com) or visit [www.rswaste.com](http://www.rswaste.com).



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## Waste-to-Energy and the Three “E”s: Energy Independence, Economic Development and Environmental Stewardship

Harvey Abouelata and Lauren Steier

**Public-Private partnerships turn waste streams into LOW-COST POWER.**

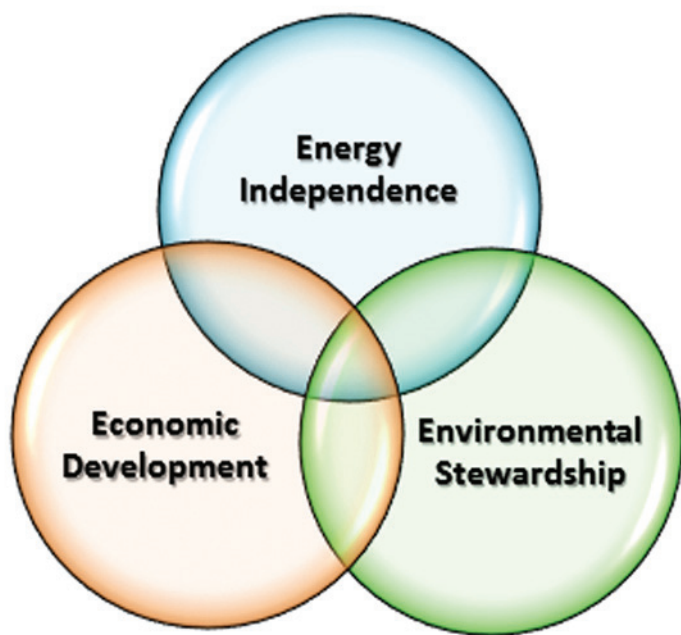
WHO WOULD HAVE THOUGHT THAT ONE OF THE final scenes from the 1980s movie *Back to the Future* showing a banana peel powering a DeLorean would be the basis for economic development, energy independence and environmental stewardship (the Three “E”s)? The reality of trash becoming treasure is upon us. According to SWANA, “Waste-to-energy is a reliable and renewable form of energy that has become the basis for many of the most successful solid waste management systems in the country.” Our landfills can be looked at as the refineries of the future.

The Three “E”s (Figure 1) are all fundamental for an autonomous sustainable community. Finding the balance between protecting the environment, creating economic development and establishing energy independence can be tricky. An excellent way of achieving this balance is by converting a community’s

waste stream into energy. An innovative and highly efficient waste-to-energy technology called the CHyP System is a bioenergy technology that is engineered and manufactured by a U.S. company called Proton Power, Inc. CHyP is an acronym for Cellulose to Hydrogen Power. It is a gasification technology that uses processed waste or biomass as feedstock to create a syngas. This syngas is then used for combustion to generate power and/or heat for homes and buildings.

### Where Waste Meets Energy

The U.S. is power hungry and our fuel is coming from finite sources, often outside of our nation. According to Department of Energy’s (DOE) Energy Information Administration’s Web site,<sup>1</sup> we consumed 4,106 billion kilowatt hours in 2011, ranking us second in the world for energy consumption per capita. That’s enough power to operate a single 100-watt light bulb for 354 million years. The EPA’s 2010 Municipal Solid Waste Facts and Figures<sup>2</sup> reported that the average individual generates about 4.43 pounds of waste per day. The U.S. Department of Commerce, Census Bureau in 2010<sup>3</sup> reported an estimated



### FACT:

**The U.S. population’s waste could create 24.5 gigawatts of capacity, capable of producing 236 billion kilowatt hours annually using efficient waste-to-energy technology.**

308.7 million people living in the U.S. These figures constitute about 175 million tons of usable trash annually for waste-to-energy conversion (subtracting approximately 30 percent for metals and other recyclable material).

Using the CHyP system, we have calculated that 6 percent of our nation’s energy needs could be provided just from the trash we are carting off to our landfills every day. According to DOE, in 2011, 13 percent of our nation’s energy came from renewables (including

Figure 1: Three “E”s.



hydroelectric). So using our trash as a fuel source could increase that number by 50 percent.

The CHyP technology is very different and far more efficient than methane capture and incineration. With methane, there is still a need for landfills or anaerobic digestion, both requiring a longer process to extract the energy. But with the CHyP System, waste is reduced upfront by diverting roughly 70 percent of what would go into a landfill and turning it into energy immediately, thereby greatly extending the life of the landfill. This process also avoids the emission of methane into the atmosphere from the landfill, which is a greenhouse gas 25 times more potent than carbon dioxide. The CHyP gasification technology differs from incineration in that more of the energy from the waste is retained in the syngas to be used to create electricity, instead of wasted in heat, producing more energy per ton than incineration. In a *New York Times* article by John Rathers entitled "Tapping Power from Trash", he reported that the "8.1 million-ton Brookhaven Town landfill, which closed to garbage in 1996, has pumped 350,000 megawatt-hours of electricity into the power grid over the past 30 years" using methane. Using the CHyP system, 8.1 million tons of trash would be reduced by 30 percent for recycling and the remaining amount would produce 6,047,494 megawatt-hours of electricity, which is approximately 17 times more electricity.

After extensive review of the CHyP technology and vetting from many third-party entities, multiple benefits and solutions are possible for a variety of applications, depending upon your motivation:

1. Profitability and economic development
2. Energy independence and autonomy

3. Resource protection and environmental quality  
Therefore, no "E" gets left behind.

## Economic Development

Turning a waste stream into a useful commodity will drive economic development by turning a former liability into an asset. Also, using equipment that is engineered and manufactured in the U.S. strengthens our nation's economy. Drastically extending the life of a landfill is a major advantage as we continue to encounter waste disposal issues such as operational costs, permitting and land requirements. According to a white paper from SWANA entitled *Waste-to-Energy Facilities Provide Significant Economic Benefits*, "monies spent on waste-to-energy technologies remain in the community, while 90 percent of monies spent on landfills will be transferred out of the local economy. Also, waste-to-energy facilities generate high paying jobs that cannot be outsourced."

## Energy Independence

The ability to produce power from a feedstock that comes entirely from the U.S. is a significant step towards national energy independence. To further this goal, we need to start at the community level. Currently, most people and businesses in a community are dependent on the utility grid for their energy and are subject to rate increases or power outages. But if communities have the ability to produce their own electricity from their own feedstock, they gain more control over the cost of their energy, thus creating an energy independent, autonomous community. This technology is one of the first affordable renewable



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## Waste-to-Energy and the Three “E”s: Energy Independence, Economic Development and Environmental Stewardship

technologies that is both on-demand and continuous, therefore allowing the option for one to be completely off the grid. Aside from using waste to generate electricity, the CHyP System can use any type of biomass, such as woody waste from brush collection, or energy crops such as switchgrass. So whether you are a business, municipality or community, this renewable energy can create true energy independence, which diminishes our nation's dependency on finite fossil fuels and foreign sources of energy.

### Environmental Stewardship

While turning waste into energy with the CHyP System helps create economic development and energy independence, it is also protecting the environment in several ways. First of all, by avoiding continuous use and creation of landfills, waste is considerably reduced and land is protected. Second, the emissions from this technology are significantly less than the emissions that would otherwise come from burning fossil fuels. And finally, our water resources are protected because these systems do not need a water source for cooling. The runoff from landfill operations into nearby waterways is also reduced or avoided. The environment, air and water are all protected by this waste-to-energy system. According to the Energy Recovery Council: “When a ton of trash is delivered to a waste-to-energy plant, several things happen: the energy content of the waste is retrieved, metals are recovered and recycled and electricity is generated. An EPA-sponsored lifecycle analysis evaluated a variety of waste management options and their associated environmental and energy impacts, and found that waste-to-energy does the most to reduce greenhouse gas releases into the atmosphere.”

Using the Brookhaven Town 8.1 million-ton landfill example, about 2.4 million tons would be recycled and the remaining solids to be disposed of after the gasification process would be approximately 227 thousand tons, which is a mere 3 percent of the original amount.

### The Sustainable Community Model

Figure 2 illustrates a public-private partnership model showing how a waste-to-energy program can provide energy independence, economic development and environmental stewardship. It illustrates how to produce power, create jobs and protect our environment in order to create a truly sustainable community with no economic leaks.

### Plan of Action

The first step is a commitment from the municipality to divert municipal solid waste (MSW) from the landfill and process it using one of the many technologies on the market today. Essentially, the MSW needs to be converted to a material that is of sawdust or dirt-like consistency to be used as feedstock for the CHyP System. Next, private industry would install CHyP Systems, and then enter a contract with the municipality to purchase the MSW feedstock. The sale of the feedstock becomes a revenue source for the municipality. The private industry can now produce low-cost electricity with a price controlled by the contract. Private industry becomes more competitive, allowing the industry to grow and become more profitable. The growth creates direct jobs, which increases the tax base for the municipality. Growth also creates a larger waste stream, which will now be needed to produce more electricity that the private industry will need. This cycle is fundamental to sustainable growth.

To create thriving communities and attract new business, the legacy of economic growth and clean energy must start today. Public and private entities are in a good position to develop partnerships that will create viable and profitable solutions for alternative energy economics. Those who take control of their energy production will insulate themselves from the inevitable escalation of utility costs. Adopters of these innovative technologies will be the leaders of the future because they understand that waste-to-energy partnerships promote energy independence, increase economic and community growth, and protect the environment by providing responsible stewardship. With public-private partnerships, energy cost predictability becomes possible. Imagine the possibilities in your community. | **WA**

*Harvey Abouelata is President of ARiES Energy (Knoxville, TN) and Lauren Steier is the Market Research Analyst. ARiES Energy is a leading energy contractor that delivers turnkey, clean and renewable energy solutions. Harvey has more than 18 years in developing business plan strategies and creative energy solutions that deliver the quickest ROI. He can be reached at (865) 309-4NRG, via email at Harvey@ariesenergy.com or visit www.ariesenergy.com.*

#### Notes

1. [www.eia.gov](http://www.eia.gov).
2. [www.epa.gov/epawaste/nonhaz/municipal/pubs/msw2008rpt.pdf](http://www.epa.gov/epawaste/nonhaz/municipal/pubs/msw2008rpt.pdf).
3. [www.census.gov/prod/cen2010/briefs/c2010br-14.pdf](http://www.census.gov/prod/cen2010/briefs/c2010br-14.pdf).

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## Rethinking Capital Equipment Investments for Multi-Generation Products

Dave Foran

**DON'T JUST THINK ABOUT TODAY'S SOLUTION. Insist that your suppliers demonstrate technology with future requirements in mind and a support model that will be by your side when the inevitable changes in your production line processes need to be made.**

### VALENTINES DAY 2006 WAS NOTABLE FOR FAR MORE

than candy and flowers. That was the day when the U.S. Patent & Trademark Office marked the 7 millionth patent milestone. Looking at patent approvals as a rough marker of new product innovation, you get a glimpse on a more global level of what you are likely to see in the global energy sector as well. Consider that in 1963 90,982 patents were approved; in 2011 that number had increased to 535,188 and was the first year when more than half of the patents were given for innovations originating outside the U.S.

The oft debated political pros and cons of globalization tend to grab the spotlight away from the fact of more engineers and technically trained minds on the planet now driving innovation—even though entire continents are still by and large left out.

In the waste handling and HAZMAT industries we see it in the form of materials innovations for positive pressure personnel suits. Valve designs—whether for waste removal truck engines, biogas processing or other renewable waste innovation technology—continue to improve and to meet the ever-shifting requirements of the evolving HAZMAT and waste industries. Even

staples like tire pressure-monitoring systems continue to evolve. Consider, too, that processing power continues to explode for lower costs, driving modeling of product improvements as a new normal.

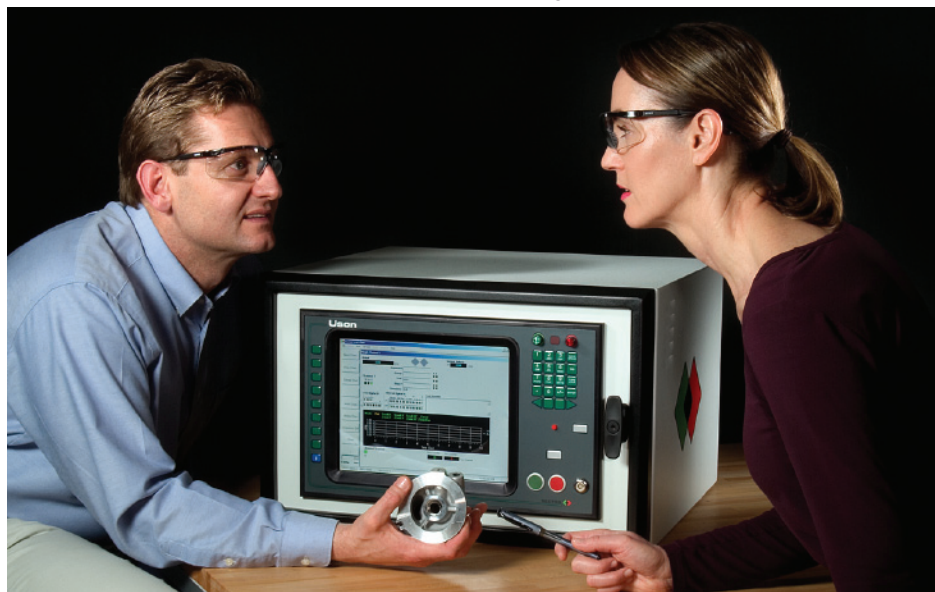
Faster innovation on a global scale is reflected in your company's microcosm or very well should be. One aspect that is begging for new consideration is how capital equipment expenditures anticipate improvements in products and shorter time-to-market. Manufacturing facilities equipped with instrumentation for needed quality controls and other plant designs either anticipate new products not even on the drawing board yet or they do not. Obviously, companies that are forward-thinking in capital equipment expenditures along these lines are building long-term advantages to grab market share through innovation.

### New Versus Out-of-Date Technology

From an engineering standpoint, it means that engineering teams (design, process, manufacturing, quality, etc.) need to be thinking about the elasticity of every capital expenditure and its real economic-life if and when product designs change.

Using leak test technology as an example because of the wide array of products in the waste and HAZMAT industries where it comes to bear on manufacturing—from sealed electronic cabinets, tank systems, valves, engine parts, etc.—one can see leak testers being sold in the global marketplace today that range from models that are truly obsolete (even if not recognized as such), to leak detectors that are fine for testing the products at hand today, to the newer generations of leak testers that feature versatility for product iterations not yet imagined.

Figure 1, page 24 illustrates how leak testers of these aforementioned categories—out-of-date vs. match for today's products only vs. designed for multi-generation products testing—stack up feature-wise. What defines out-of-date leak testers in their core is likely mirrored in out-of-date technology for other manufacturing automation and instrumentation. These are largely leak testers that were designed with electronic componentry, processors and data handling methods from an earlier era. These are inflexible leak testers that have limited ranges



Future-proofing your capital investments also means adding the most experienced NDT experts to your team who stay with you and support your test instruments from cradle to grave. Images courtesy of USON.



**Figure 1: Leak Tester - Current vs. Future ROI Comparison Chart.**

Leak Tester Options Today	Out-of-Date	Match for Today's Product Only	Designed for Multi-Generation Products Testing
Support	At Purchase or Limited Warranty	Lifetime but Limited to Today's Application	Lifetime, Including Reconfiguring for New Products
Possible Test Combinations	Limited	Limited	Unlimited
Test Pressures	Mismatched Pressure Range for Application	Vacuum to 500 psi	Vacuum to 3,000 psi
Test Part Volumes	Limited Range	Wider range	Widest Range
Pneumatics Configurability	No	Application Specific	Fully Customizable
Test Program Storage	Very limited	99	199+
Test Data Storage	Memory Cards, PCMCIA, PROM	USB	128G Flash Drive to 30G Hard Drive
Number of Test Sensors	<3	3-4	1- 20
Synchronous Test Capable	No	Some	Yes
Independent Test Capable	No	No	Yes
I/O Flexibility	No	8/37	32/122
Graphical Operator Controls	No	Yes	Yes
Networkable	No	Some	Extensive
Email Alerts	No	Some	Yes
Complex Test Capability	Low	Medium	High
Part Grading	Pass/Fail Only	Pass/Fail Plus	Pass/Fail Plus

Figure courtesy of USON.

and are usually not optimized for the application at hand. Dated leak testers are called out because usually a new manufacturing engineer calls in asking for technical support for a leak tester that had essentially been mothballed. There are also companies that are “penny-wise but pound-foolish” that have done nil capital equipment investments for quite some time not realizing how their operation is saddled with longer test cycle times or other ‘hidden costs’ of out-of-date technology.

As Figure 1 suggests, current technology has far more sophisticated programming capabilities that can handle more complexity in testing and data storage. Modern leak testers were born in the age of globalization and feature more intuitive graphical displays that allow more lightly skilled workers to operate the test technology. Today's testers can handle a wider range of test specifications—parts volumes and pressures for example.

However, if you are sourcing a new leak test instrument, an important lens to view the technology through is how adaptable it will be for new product innovations. The newest models of leak testers—like other instruments

or aspects of automated systems—are notable first and foremost for their flexibility. In terms of leak testers, they have multiple sensors, multiple test channels or both—such that there are possibilities to speed production with either synchronous or independent testing of multiple parts of components of parts. These leak testers are also distinguished by their fully customizable pneumatics and flexibility for I/O programming. Like other future-focused capital equipment, they handle a good deal of complexity automatically so that they are simple to operate. In the case of future-focused versatile leak testers, they are distinguished by their ability to handle virtually any combination of leak, flow, burst, occlusion and other NDT tests of that nature. They include sensors that can be re-tuned to new product specifications in the future. Their pneumatics are totally configurable and re-configurable. They handle orders of magnitude greater test data results and/or test steps complexity.

There is a wide array of leak detection systems available today. The real economic life of any leak detector you choose is now determined by how flexible it will be to handle leak test requirements that are not yet on your docket. Leak





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The greater ability to program I/O is a critical feature in leak testers and similar capital equipment investments built with an eye towards future scenarios that are currently unknown in their specificity.

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testers are no different from other capital expenditures for manufacturing. The fork in the road is whether to choose application specific testers for today's needs or those that offer future flexibility built in.

### Future-Focused Capital Equipment Investments

There are some inherent markers that will help you discern more future-focused capital equipment investments from those that are more fixed to the strict specifications of today. First, a word to the wise is to make sure that the product is supported cradle to grave, including support for re-configuring the instrument or other equipment for future applications. With leak testers, there are actually many manufacturers that provide absolutely no support once a leak tester is sold. Others will assist with an initial installation but then leave it at that. If you are future-focused on capital equipment uses, the value of long-term support should be clear.

Another lens to view potential capital equipment through is its versatility and the relative ease or difficulty of reconfiguring the equipment or instrument in the future. Pneumatics are an essential element of leak test systems and for optimum efficiency they need to be tuned to your application specifications—e.g. parts volume, test pressures, etc. But, if you take it as a given that your continuing innovation will inevitably change these physical parameters, you need to ask how easily your leak tester's pneumatics can be reconfigured. For any instrument or capital equipment expenditure there are comparable aspects that are essential to function and are either designed for re-configuration or are fixed. This is not to say that there are not leak testers that are not flexible for the future that are nonetheless very high-end instrumentation and equipment for today's applications. In some cases this is still preferred and the data handling, programming capabilities are more than adequate for the NDT tests required.

However, sometimes, we find that even within the constraints and specification of the current test application, leak testers with greater upfront costs are not given their fair due. For example, a leak tester that can do eight simultaneous leak tests can have



much lower overall testing costs than a leak tester with a more limited number of sensors and/or channels. It's rarely complicated to do the math to make the determination on returns-on-investments for today's application. Moreover, with a long range view in mind that anticipates new test methods being required you know that the lifetime return-on-investment is greater still, although admittedly not lending itself to simple "do the math" type calculations.

The extent to which any instrument or piece of equipment used in a production line (such as a leak tester) is programmable is also a rough marker of how well suited it will be to handle future product iterations. When there are greater I/O capabilities built in, it suggests an inherent ability to handle testing complexity. In the case of leak testers, it may mean that the firmware in the leak test instrument has more programmable steps, possibly hard-wired to jump to another test step or an entirely different program for greater flexibility. More I/O flexibility in future-matched leak testers (i.e. 32/122 as shown in Figure 1) means that your operations will be able to change sequences in tests based on the results of a prior step. This greater ability to program I/O is an ideal match for future scenarios that are currently unknown in their specificity.

Companies that are most proactive in R&D for new product developments are employing the more flexible technology for product development today. Being able to try different test scenarios helps ensure that the optimum settings and configuration of the leak detector are defined when the product rolls out. This is especially important to the many companies that are not only eager

to make time-to-market as quick as possible but who plan to then produce products in globally distributed manufacturing facilities.

## Establish Consistent Quality

In summary, the valves, renewable waste equipment, tanks and other products with strict leak rate specifications used in the HAZMAT and waste industries today are very likely to change in significant ways within the decade. New materials innovations such as composites, nanotechnology, ongoing market feedback on better feature design or additional features to enhance usability are just some product innovation drivers we can count on. The shorter your company's time-to-market for product innovations, the greater your ability to garner market share. Similarly, the ease with which you can establish consistent quality with globally distributed manufacturing will impact your company's ability to gain footholds in new terrain.

Don't just think about today's solution—also think about tomorrow and insist that your suppliers demonstrate technology with future requirements in mind and a support model that will be by your side when the inevitable changes in your production line designs and processes need to be made. **WA**

*Dave Foran is President of USON (Houston, TX), which first developed high accuracy leak testing methods for NASA, and for nearly half a century has been at the forefront of leak detection, leak testing and non-destructive testing for a wide range of industries. Dave can be reached at (281) 671-2000, via e-mail at [dave.foran@uson.com](mailto:dave.foran@uson.com) or visit [www.uson.com](http://www.uson.com).*



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## Railcar Design and Use

Darell Luther

**Matching commodity handling requirements and commodity type to a specific railcar is PARAMOUNT TO USING THE CORRECT RAILCAR FOR YOUR BUSINESS.**

### RAILCAR DESIGN AND USE IN THE WASTE BUSINESS

has evolved as the industry has adapted to movement of waste by direct transfer or intermodal container drayage to a distribution yard. Railcars used in waste transfer are comprised of varying types of gondolas and flat railcars. There are three main railcar classifications and many sub-classifications of railcars capable of transporting waste commodities:

- Gondola railcars
- Flat deck railcars
- Articulated bulk railcars

### Gondola Railcars

Gondola railcars are very flexible in hauling bulk commodities. They are generally used for scrap and recyclables, contaminated soil, construction and demolition debris, and municipal solid waste. There are segregations of gondolas and the type of gondola one uses depends on the commodity being transported.

Mill gondolas are generally used for scrap and recyclables. They are smaller cars in cubic capacity designed to transport dense heavy materials. Mill

gondolas can be categorized in two general interior lengths (there are a few outliers), 52' and 65' and several different cubic capacities depending on overall interior side height. Interior side heights vary from 3' 8", 4', 4' 6", 5' to 6', resulting in cubic capacity differences on 52' cars of 1,848 cube to 2,500 cube to 2,743 and 2,800 cubic foot. Although 65' cars are available for use in dense scrap and recyclable products, they are generally used in finished products such as plate steel, bar and similar products. There are two distinct designations in carrying capacity for mill gondolas. Gondolas are classified as 100 ton or 263,000 gross weight on rail and 110 ton or 286,000 gross weight on rail capacity. The designation of gross weight on rail is the maximum capacity the railroads will accept on their rail. This weight is comprised of the lading weight of the commodity and the tare weight of the railcar which cannot exceed the railroads designated gross weight on rail.

Coal gondolas have been adapted over the years to be used in hauling contaminated soils, construction and demolition debris, and municipal solid waste. In the late

Mill Gondolas transporting contaminated soil.  
Photos courtesy of Tealinc.





1980s and early 1990s, railroads pushed coal shippers and receivers to switch from steel coal cars to more lading efficient aluminum railcars. This created an opportunity for surplus steel railcars in the waste industry. In my experience as Unit Train Director at Southern Pacific Railroad, we initially started backhauling contaminated soils from the Los Angeles basin to Utah and rotary dumping the railcars at a landfill. When the railcars were empty and the train put back together, cars would be sent off to Utah to haul another load of coal from the coal mines in Utah to the export terminals in Los Angeles and repeat the process. As time progressed more railcars were put into service hauling municipal solid waste from major metropolitan areas to regional landfills.

Modified coal railcars/C&D railcars were the natural progression as more and more companies transported lighter weight material from transfer yards or stations to landfills. Initially, the only modifications complete to coal cars were the removal of interior bracing and strategic reinforcement to maintain the integrity of the railcar. However, customers weren't satisfied since the capacity was still just 4,000 cube and oftentimes meant that small payloads of 40 to 60 tons of "garbage" or "C&D" could be transported. Having the option to transport 100 plus tons pushed railcar development to be more waste transport friendly. The first of these developments was the increase in cubic capacity of railcars. The first increase of capacity was to increase side height. This added the requisite additional cubes to haul additional tonnage. The next increase was to not only increase side height, but also to stretch the railcar to maximum payloads in the 95-ton range. In some cases as much as 11' was added to a railcar that had an overall length of 53' to start. This proved to be a

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TOP: 5,700 cubic cube car for C&D transport.  
RIGHT: 89' 70 ton flat at transfer station.

very effective capacity solution in some cases retrofitting railcars from 4,000 cubic foot capacity to as much as 5,700 cubic foot capacity. Railcar builders then took note of this phenomenon and built a specific C&D railcar that was capable of 286,000 lbs. gross weight on rail with 6,500 cubic foot capacity to haul a full 110-ton load of lightweight commodity.



### Intermodal Flat Railcars

Intermodal flat railcars were introduced into the waste hauling stream much the same as the gondola railcar. The first flat railcars to be used in hauling containerized waste were intermodal castoffs. These first flat railcars were 89' in deck length and could transport 140,000 pounds of product and containers and are rated at 220,000 lbs. gross weight on rail, meaning the railcar, container and product in the container could not exceed 220,000 lbs. They were initially set up to be able to transport four 20' containers or two 40' containers. Most waste intermodal was set up initially using 20' ISO containers that established the footprint for waste container use on flat cars. Over time as the waste-by-rail transport industry grew, the same phenomenon occurred in waste flat cars as occurred in coal gondolas. A group of innovate and creative individuals engineered the 70 ton car so that it could transport 100 tons of containers and commodity. This increased the use and made rail transport of containerized waste commodities even more economical. Soon after, railcar builders constructed a new waste intermodal railcar capable of transporting 110 tons of container and waste. This car is 85' in overall length and has a lightweight spine design made to lower the overall tare weight of the railcar leaving additional capacity for loaded containers. The gross weight on rail of this railcar is 286,000 lbs.

### Articulated Bulk Commodity (ABC) Railcars

ABC cars were first introduced in the early 1980s and grew in popularity as the need for moving ever denser products increased. An ABC railcar is two platforms connected by an articulate truck that is capable of





8,100 cube MSW gondola.



Flat bottom coal gondola for C&D and MSW.

carrying four 20' densely loaded containers or two 40' containers. The overall capacity of the cars is 177 tons over a 90' overall length railcar. The railcars are highly efficient for moving large volumes of containerized waste from a fixed transfer yard to a landfill or incinerator.



### Determining Which Railcar Is Right For You

Matching commodity handling requirements and commodity type (e.g. bulk, baled or containerized and density) to a specific railcar is paramount to using the correct railcar for your business. Origin, lane and destination capabilities and requirements also play an important role in railcar selection as

the shipper/receiver must keep in mind any online constraints including gross weight on rail, length and height. | **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 director's 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](http://www.tealinc.com).*

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## Killing People With Kindness

John Wayhart

**"If I just would have SAID SOMETHING, this wouldn't have happened."**

### YEARS AGO, I MET WITH A VERY DYNAMIC WASTE

and recycling company to review their insurance and risk management program. During the visit, I had the opportunity to meet with various supervisors and employees in the plant. One of the main questions I proposed to the group was "what have we done this past year that we are proud of and where can we improve?"

I'll never forget the response that one employee gave that I don't think anyone in the room was expecting. He said with clear conviction that "we do a very good job here in killing people with kindness." His comment forever changed my notion of how to "professionally confront" people within the workplace. Are we being too polite and not challenging workers to perform better and safer? Do we not say anything when we see someone lifting wrong or not consistently checking a blind spot when driving a truck for fear of offending them?

### The Numbers Say It All

With a death rate of 25.2 per 100,000<sup>1</sup>, the waste and recycling industry has been consistently rated in the top 10 most dangerous jobs. In an industry more prone to injury or death, there really is no such thing as kindness when it comes to protecting ourselves and fellow coworkers. That is not condoning supervisors or fellow employees to be condescending when critiquing one another; rather, it means looking at the numbers and understanding that a Zero Accident Culture means holding one another accountable and seeking out best practices in regards to on-the-job safety.

### Communication Breakdown: Supervisors

The traditional responsibility of communication is typically a top-down structure from "the boss to the labor". Companies should continue to search for more effective ways to get the corporate safety message across in order to reduce potential claims and time off from work, as well as a better bottom line. Additionally, open and confidential communication should always be welcomed by the management team in case a situation arises where a fellow coworker does not feel comfortable addressing a safety issue that could potentially affect one or more individuals at the company. The supervisor has the ultimate role of being the eyes and ears of his team and confronting any situations that jeopardize the safety of others.

To clarify this point, I went back and thought about situations I've encountered where supervisors did "kill people with kindness". Here is one example that resulted in a large workers' compensation claim and altered the life of a coworker:

A waste-to-energy company had a wide shear press that needed two men on the job. One side had a remote control button that required the operator to be away from the point of operation; therefore, you had to wrongfully rely on the operator to communicate verbally or hand signal when the remote control device was to be engaged. The supervisor knew this wasn't correct and, in fact, was a strict violation of standard safety practices and willful violation of OSHA. They should have had a two-hand safety control device that both members would press to activate the machine. But the supervisor simply allowed this to go on until the other remote mechanism was delivered and installed. Within two days, a second shift employee lost his hand when the single remote control device was activated by his co-worker.

The moral of this story is that the supervisor should have never knowingly allowed for an unsafe practice





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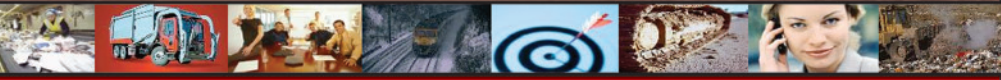
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## Killing People With Kindness

to continue whether it affects production or not. Upon noticing the violation, he should have communicated the problem with the workers and a consequent plan of action, such as turning the power off. Instead, a tragic error occurred that resulted in a costly claim, as well as severed the hand of a worker whose life changed forever.

### Communication Breakdown: Coworkers

On the same note, "employee to employee" communication is often an overlooked category, as so many peers fear being a rat or tattletale and try to avoid a possible conflict. Professional confrontation is an art form. Once we are allowed to be comfortable in this action, we are no longer "rating" on someone; instead, we are caring for them and their family. Overall, constructive criticism through an educational and professional tone will be more beneficial in the long run. To further clarify the point of coworkers "killing people with kindness", here is one industry example that could have resulted in even larger, company-altering claims.

A driver at a waste hauler who was well liked by everyone, the "life of the party" and a long-term employee, had a borderline drinking problem that impaired his ability to be an alert driver. He had several small wrecks and bumps of equipment in the past, but one day, he fell asleep at the wheel and ran into a building and parked cars alongside the street. Luckily, no one was injured, yet there was significant property damage. When it happened, the first comment from many of his coworkers was, "I knew that was going to happen" ... "just a matter of time." The driver was written up for a DUI, as well as dangerous and reckless driving of a commercial vehicle. No one had ever talked to him about his well known, historical habits and how it affected his job.

This person lost his driving job and ability to hold a CDL license. Another person incurred property and auto damage. The company incurred costly claims. The worst part of all is what could have happened: someone could have been killed. But none of the coworkers who knew of his drinking habit said a word to the supervisor or took a proactive stance to help prevent this inevitable crash.

### Grading Scale

Have you ever thought about measuring the effectiveness of evaluations in order to prevent "killing people with kindness"? As a supervisor, observe and grade the following safety hazards to hold your team accountable and ensure that yourself nor other workers are killing each other with kindness:

- An employee not wearing his/her assigned and expected personal protective equipment?
- An employee lifting something and does not request a buddy or mechanical lift?
- An employee working with an unguarded or poorly maintained piece of equipment?





- A driver driving too fast for conditions or speeding through a construction or school zone?
- A driver texting, using a mobile phone or other distractions while driving?
- A driver not performing a pre-trip inspection and using an inferior waste hauler?
- An employee who was over served (alcohol/drugs) the night before and is lethargic or not alert at work?

## Incident or Accident

After grading employees, review any recent claims and injuries. Diagnose whether this could have been prevented from reiterating a rule or providing guidance. Furthermore, question the validity of the word "accident" and whether that truly applies to the claim or injury. The word "accident" is generally a misnomer, as oftentimes we know what's wrong and simply look the other way or could have prevented it to begin with. The use of "accident" removes or absolves responsibility and an injury should be labeled as an "incident." To avoid future incidents that will directly affect a coworker and others either in or outside the company, make certain your employees are not "killing with kindness". | **WA**

*John Waybart is a Senior Vice President at Assurance Agency (Schaumburg, IL). With more than 29 years in the insurance and risk management industry, his expertise lies in providing solutions for a wide range of businesses including the waste and recycling industries. In 1989, John trademarked Zero Accident Culture® and continues to teach,*



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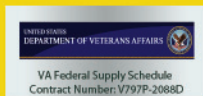
#### Note

1. U.S. Bureau of Labor Statistics.

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## Breakthroughs and Innovations



WAYNE ENGINEERING (CEDAR FALLS, IA) designs and builds MSW collection vehicles that are used nationwide. Its Curbtender Auto Side Loader, first offered in the 1970s, set new standards for productivity. More recently, the company introduced a commercial-class front loader and full-size rear loader, along with a one-man commercial container handling system that can be included on new machines or adapted to fit existing equipment. Wayne Engineering's design engineers constantly look for opportunities to improve machine performance, and collaborate with trusted partners.

Most recently, managers from Wayne Engineering met with Phil Dybing and John Wagner of the Eaton Commercial Vehicle Market Development Team to discuss Eaton's development of time and fuel saving advancements for refuse collection. The Eaton team presented the newest set of hydraulic work system solutions, Power On Demand (POD) Advanced Technology, which improves productivity while reducing costs. Scott Kanne, Wayne Engineering's vice president of sales and marketing, understood immediately how a POD system could help operations and fleet managers meet the challenges of waste collection and disposal. The advantages for municipalities and private fleet owners are clear: Wayne Engineering refuse trucks with Eaton POD technology offer higher performance in daily operation, reducing labor expenses immediately and reducing total cost of ownership over time.

FOR MORE INFORMATION, CALL (319) 266-1721 OR VISIT [WWW.WAYNEUSA.COM](http://WWW.WAYNEUSA.COM).



CUMMINS WESTPORT's (Vancouver, BC) online Natural Gas Academy is where you can visit to learn about natural gas as a clean burning fuel for vehicle transportation, such as truck and bus. Check out the videos, information and links to other industry sources of information about natural gas, fueling stations, onboard fuel storage, training and incentives. They also feature a fuel quality calculator to help you determine if the natural gas in your area meets Cummins Westport engine fuel requirements.

FOR MORE INFORMATION, VISIT [WWW.CUMMINSWESTPORT.COM/NATURAL-GAS-ACADEMY](http://WWW.CUMMINSWESTPORT.COM/NATURAL-GAS-ACADEMY).



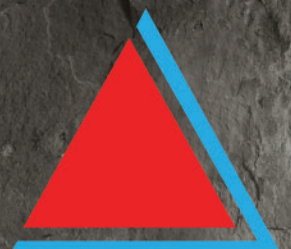
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## Breakthroughs and Innovations



VOCATIONAL ENERGY's (Tampa, FL) Portable Fuel System (PFS) allows fleets that operate CNG vehicles a way to fuel at their location without a traditional 'brick and mortar' station, which means that fleet owners can take advantage of the cheaper fuel faster. Customers don't have to wait to migrate to CNG vehicles and also allows them the convenience of fueling at their location, rather than driving their trucks to a public station across town. CNG is one of the fastest growing fuels to power garbage trucks in the nation, but conversions can be hampered by the lack of infrastructure in many cities. The PFS is a simple, cost-effective method to bridge that gap. It is designed to be transportable by a standard commercial roll-off truck, something that most refuse fleets already have in their inventory. Customers wouldn't have to incur the additional expense of additional driver training or special vehicles to deliver or move the PFS. It merely needs to attach to a customer's existing natural gas service, be supplied electrical power—and the unit is capable of fueling up to eight vehicles simultaneously. The PFS can also be rented through Big Truck Rental, as a temporary fueling solution. The rental niche is designed to service those customers who want to begin using newer CNG-fueled trucks while their stations are under construction. Vocational Energy's goal is to grow the domestic CNG fuel market by removing barriers, such as infrastructure limitations. The PFS is a great product that facilitates that effort.

FOR MORE INFORMATION, CONTACT JEFFRY SWERTFEGER AT (813) 957-1846 OR VISIT [WWW.VOCATIONALENERGY.COM](http://WWW.VOCATIONALENERGY.COM).



KRC INDUSTRIES' (Columbus, OH) Raptor 357 features a unique, magnetized patent-pending system that allows you to attach the bait station directly to the underside of dumpsters, food service equipment and even the back of metal doors. The Raptor 357 is virtually indestructible with a powerful magnetized grip. It features:

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RouteOptix application interface showing a license scan form. The form includes fields for License #, Input Scan, Route, Customer, Location, Service, Date, Vehicle Description, and Material. It also displays a table of scanned items with columns for Item, Material, Gross, Net, and Total.

Item	Material	Gross	Net	Total
1	PR170 - Automotive Batteries - LB	100.00	0.00	100.00
2	AL321 - Dry Aluminum Copper Plats - LB	90.00	0.00	90.00
3	BF190 - Plumbing Brns - LB	20.00	0.00	20.00
4	BF190 - Plumbing Brns - LB	0.00	0.00	0.00

populated into the RouteOptix application. Driver license information can be extracted from all U.S. states and Canadian Provinces. This automates the process by negating the need to enter customer information and eliminates the possibility of human error.

The industry also needs to have the ability to print checks to pay customers for the scrap they receive and RouteOptix provides the functionality to print checks directly from the accounting section of its software application. If a scale is connected to a computer, scale parameters can be set-up in the RouteOptix application to read weights and take information about materials and volumes directly into its application. FOR MORE INFORMATION CALL (866) 926-7849 OR VISIT [WWW.ROUTEOPTIX.COM](http://WWW.ROUTEOPTIX.COM).

ROUTEPTIX (Kitchener, ON) adds the scrap metal industry to the list of vertical markets it serves. RouteOptix is pleased to be able to offer features to this industry who serve many one-time and repeat customers arriving at their facilities to drop off scrap metal. Some of the challenges scrap metal facilities encounter is the need to quickly identify who the customer is at time of entry to their yard, the volume of material(s) being sold to them to ensure inventory records are correct and available for review if required, and the ability to print checks to pay for the scrap they are receiving.

RouteOptix has integrated a driver license scanning software product into its application. The powerful scanner uses Optical Character Recognition to convert a full image of the license. The data from the scanned license is then



EMERY WINSLOW SCALE CO.'s (Seymour, CT) Roadweigh II™ "Quick Clean" series H80-QC is an axle scale designed with an easy removable deck for a quick pit cleanout. It sets a higher standard for long life and durability because it is engineered to eliminate downtime, especially designed for waste and garbage weighing in a tunnel transfer application. The heart of the Roadweigh II "Quick Clean" series is the Emery Winslow Hydrostatic™ PermaCell™ and a quick guidance mechanism designed with immunity to a power wash cleanout and a quick deck removal and replacement. Removing the deck, power washing, cleaning the pit, replacing the deck and resumption of weighing can all be accomplished in a 30-minute span.

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FOR MORE INFORMATION, CALL (203) 881-9333 OR VISIT [WWW.EMERYWINSLOW.COM](http://WWW.EMERYWINSLOW.COM).



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- Triple grabber with rubber grips
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DURABAC's (Granby, QC) Duraplast heavy-duty polyethylene organic waste front load containers are constructed of high quality 100 percent virgin medium low density exclusive polyethylene. This material will stand up to -40°C impacts and resist chemicals and petroleum based liquids. The UV stabilizer will protect the original color pigmentations. The side pockets are 10 GA steel reinforced with a unique front belt to protect from truck forks.

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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.

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## Recycling

# Collection Programs For Kitchen Organics: Impacts of Program Design Decisions on the Material Diverted

Maria Kelleher

**MANY CITIES AND COMMUNITIES IN THE U.S. AND CANADA HAVE SET** residential waste diversion targets of 50 percent and higher. A good curbside collection program for recyclables and leaf and yard waste can achieve a diversion rate of 35 percent or higher. However, to get to a value of 50 percent, it is essential to divert food waste, which makes up as much as 25 percent of the residential waste stream.

### Source Separated Organics

Residential collection of source separated organics (SSO) (mostly kitchen organics consisting of food waste and kitchen papers) is increasing rapidly across the U.S. and Canada. Implementation of residential SSO programs requires many decisions: what materials to collect, how they should be stored in the home and collected at the curb, the processing approach used (composting or

anaerobic digestion), policies that could increase participation and capture in residential SSO programs, and the most appropriate end markets for finished compost. One of the program design decisions is which type of kitchen catcher bag (paper, plastic, biodegradable plastic or certified compostable plastic) to allow for set out of SSO in curbside bins.

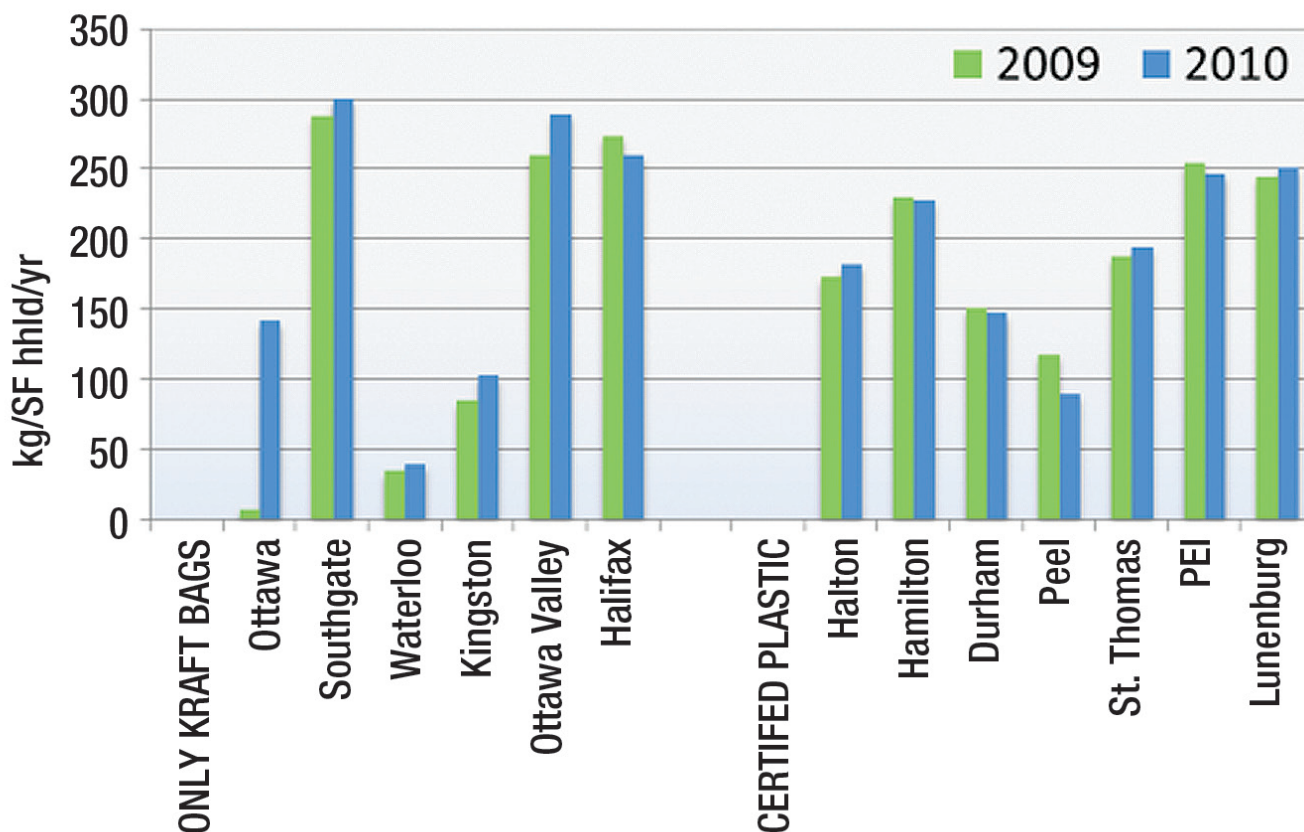
### SSO Program Performance

The impacts of different bag choices (paper, plastic, biodegradable plastic or certified compostable plastic) were examined as to what effect they had on SSO program performance.<sup>1</sup> Operating data were collected from SSO programs across Canada, predominantly in the provinces of Ontario and Nova Scotia. The information collected included:

- Year that the SSO program was implemented

**Figure 1:** Annual collection of SSO from select Canadian communities, 2009 and 2010.

Figure courtesy of Kelleher Environmental based on information in the Waste Diversion Ontario Municipal Datacall ([www.wdo.ca](http://www.wdo.ca)).







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Green Bins and Blue Recycling Bins set out at curbside in Toronto, Canada. Photo courtesy of Maria Kelleher.

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- Households served
- SSO tonnage collected annually since the program was initiated
- Type of bags permitted in SSO bins (paper only, compostable plastic, biodegradable plastic or plastic)
- Frequency of garbage collection (weekly or bi-weekly)
- Other curbside or other policies that would impact on participation (bag limits, PAYT programs, etc)
- Location where SSO was processed
- Residue rates at the processing operation

The conclusion of the analysis was that many factors impact the performance of the SSO program. Some key factors are:

- *Age of the program (number of years in operation)*—Participation in SSO programs generally increases and the amount of SSO collected generally increases over time as residents become used to the program requirements, and adapt their behaviors to suit the set-out requirements of the new program, as long as a consistent promotion and education program is maintained. The highest collection rates were measured in Southgate, ON, Halifax, NS and Ottawa Valley, ON—all of these programs have been in place for a number of years.

- *Frequency of garbage collection*—Participation in SSO programs (measured as the percent of all households who set out the Green Bin once per week or at least twice per month) and capture of SSO (measured as pounds per household per year collected in a source separated state) are both higher in communities which only collect garbage every other week. Less frequent garbage collection service encourages people to use the Green Bin more.

- *Curbside policies*—SSO program performance is better in communities with lower garbage bag/container set out limits and in communities where extra bags or containers of garbage cost extra (through a tag system)



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- *Size of curbside Green Bin containers provided, and extent to which leaf and yard waste are collected in the Green Bin*—Some communities chose small 46 liter Green Bin containers, which collect kitchen waste only whereas other communities chose a larger Green Bin container, and allow some leaf and yard waste in the green bin. Bin sizes in the programs studied included: 46, 80, 120, 140 and 240 liters. The community decision on the bin size is generally related to optimizing the collection system design. It also impacts on processing options chosen.

## Conclusions

The research found that the choice of a particular type of kitchen catcher bag (paper, plastic, certified compostable plastic or biodegradable plastic) did not significantly impact on participation or capture rates in the programs examined—there were generally a number of other factors at play (including the list of the materials collected, the age of the program, frequency of garbage collection, curbside policies and size of Green Bin) that influenced participation rates and capture rates. **Figure 1, page 46** presents collection values (in kg per household per year) for programs that allow the use of paper bags and certified compostable plastic bags in “kitchen catchers” (countertop kitchen bins). Capture levels are low for Kingston and Waterloo, ON as the programs are new—both were launched in 2009 and 2010.

Composting facility operators contacted for the study preferred paper bags, as these compost readily in existing systems, and result in residue rates of

“virtually zero”. All facility operators noted that certified compostable plastic bags compost more slowly than paper bags, and they experience higher residue rates from programs that use plastic bags, including biodegradable and certified compostable bags. Operators commented that a well run composting operation should be able to achieve a residue rate of below 5 percent.

Green Bin programs are being implemented across North America. A number of years ago communities were faced with making decisions without significant information on what impacts the design decisions might have on program performance. There is now significant operational experience to draw on to help program designers choose a system that suits the needs of their community. Well-performing programs include a blend of policies and practices that best meet community needs and diversion targets, while integrating collection decisions with the broader integrated waste management system, and taking account of the implications of program design decisions on the organics processing operation. | **WA**

*Maria Kelleber is Principal at Kelleber Environmental, an environmental consulting company based in Toronto, ON. Maria has more than 25 years of experience in researching and evaluating waste diversion and renewable energy policies and programs. For more information or to obtain a copy of the full report, e-mail [maria@kellenv.com](mailto:maria@kellenv.com) or visit [www.kelleberenvironmental.com](http://www.kelleberenvironmental.com).*

## Note

1. Bag to Earth, a manufacturer of kraft paper kitchen catcher, Green Bin and leaf and yards waste bags, commissioned Kelleber Environmental to perform the study.



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## Resource Spotlight

### EPA's Office of Solid Waste and Emergency Response

#### THE OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE (OSWER)

provides policy, guidance and direction for the EPA's emergency response and waste programs. They develop guidelines for the land disposal of hazardous waste and underground storage tanks. They provide technical assistance to all levels of government to establish safe practices in waste management and administer the Brownfields program which supports state and local governments in redeveloping and reusing potentially contaminated sites. OSWER also manages the Superfund program, which responds to abandoned and active hazardous waste sites and accidental oil and chemical releases. Finally, the office encourages innovative technologies to address contaminated soil and groundwater.

#### Office of Superfund Remediation and Technology Innovation (OSRTI)

OSRTI administers Superfund, the federal government's program to clean up the nation's uncontrolled hazardous waste sites. They are committed to

ensuring that remaining National Priorities List hazardous waste sites are cleaned up to protect the environment and the health of all Americans. OSRTI implements the Comprehensive Environmental Response, Compensation, and Liability Act. Programs and projects managed by OSRTI include:

- National Priorities List
- Recovery Act funding for Superfund sites
- Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)
- Community involvement

#### Office of Resource Conservation and Recovery (ORCR)

ORCR's mission is to protect human health and the environment by ensuring responsible national management of hazardous and nonhazardous waste. ORCR implements the Resource Conservation and Recovery Act. The goals are to:

- Conserve resources by reducing waste



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- Prevent future waste disposal problems by enforcing regulations
- Clean up areas where waste may have spilled, leaked or been improperly disposed

Programs and projects managed by the Office of Resource Conservation and Recovery are:

- Hazardous waste, including recycling, corrective action (cleanups) and household hazardous waste
- Municipal solid waste and recycling
- Resource Conservation Challenge
- Plug-In to eCycling
- WasteWise Partnership
- Product Stewardship

### Office of Underground Storage Tanks (OUST)

OUST carries out a Congressional mandate to develop and implement a regulatory program for underground storage tank systems. An underground storage tank system is a tank and any underground piping connected to the tank that has at least 10 percent of its combined volume underground. OUST implements provisions of the Energy Policy Act of 2005. Programs and projects managed by OUST include:

- Recovery Act funding for leaking tanks
- LUST Trust Fund

### Office of Brownfields and Land Revitalization (OBLR)

The Brownfields program empowers States, communities and other stakeholders in economic redevelopment to work together in a timely manner to prevent, assess, safely clean up and sustainably reuse brownfields. A brownfield is a property, the expansion, redevelopment or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant or contaminant. OBLR implements the Small Business Liability Relief and Brownfields Revitalization Act. Programs and projects managed by OBLR include:

- Recovery Act funding for brownfields sites
- Land revitalization

### Office of Emergency Management (OEM)

OEM works with other federal partners to prevent accidents as well as to maintain superior response capabilities. One of our roles is to provide information about response efforts, regulations, tools and research that will help the regulated community, government entities and concerned citizens prevent, prepare for and respond to emergencies. OEM administers the Oil Pollution Act and several other environmental statutes. Programs and projects managed by OEM include:

- Emergency Planning and Community Right-to-Know Act Requirements
- Facility Response Plan Rule
- Local Governments Reimbursement Program

- National Contingency Plan Subpart J Product Schedule
- Reporting Oil Discharges and Hazardous Substance Releases
- Risk Management Plan
- Spill Prevention, Control, and Countermeasure Rule

### Federal Facilities Reuse and Restoration Office (FFRRO)

FFRRO works with the U.S. Department of Defense, Department of Energy and other federal entities to develop creative, cost-effective solutions to their environmental problems. FFRRO's overall mission is to facilitate faster, more effective and less costly cleanup and reuse of federal facilities. By focusing on partnering and public involvement, FFRRO and its counterpart offices in the EPA Regions have made great strides in improving federal facilities cleanup. Programs and projects managed by FFRRO include:

- Federal facilities restoration and reuse program
- Superfund federal facilities response; Base Closure and Realignment
- Federal facility site information | [WA](http://www.epa.gov/aboutepa/oswer.html)

For more information and further contact information for each office, visit [www.epa.gov/aboutepa/oswer.html](http://www.epa.gov/aboutepa/oswer.html).

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## Landfills

# Closure and Post-Closure Care Requirements for Municipal Solid Waste Landfills

### THE CLOSURE AND POST-CLOSURE CARE REQUIREMENTS FOR MUNICIPAL

solid waste landfills (MSWLFs) establish the minimum requirements with which MSWLF owner/operators must comply once the landfill stops receiving waste and begins closure. Owner/operators also are required to continue monitoring and maintaining the landfill once it is closed to protect against the release of hazardous constituents to the environment.

### Final Cover Systems

The closure standards for MSWLFs require owner/operators to install a final cover system to minimize infiltration of liquids and soil erosion. The permeability of the final cover must be less than the underlying liner system, but no greater than  $1.0 \times 10^{-5}$  cm/sec. The reason for this requirement is to prevent the "bathtub effect" where liquids infiltrate through the overlying cover system but are contained by a more permeable underlying liner system. This causes the landfill to fill up with water, increasing the hydraulic head on the liner system that can lead to the contaminated liquid (leachate) escaping and contaminating groundwater supplies.

The final cover system must consist of an infiltration layer of at least 18 inches of earthen material covered by an erosion layer of at least 6 inches of earthen material that is capable of sustaining native plant growth. An alternative cover design may be used as long as it provides equivalent protection against infiltration and erosion. Such alternative designs must be approved by the director of an approved/authorized state program.

### Closure Plans

Every MSWLF is required to prepare a written closure plan that describes the steps necessary to close the unit in accordance with the closure requirements, including:

- A description of the final cover design and its installation methods and procedures
- An estimate of the largest area of the landfill requiring a final cover
- An estimate of the maximum inventory of waste on site during the landfill's active life
- A schedule for completing all required closure activities

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Once a MSWLF has received its final shipment of waste, it must begin closure operations within 30 days. A MSWLF, however, may delay closure for up to one year if additional capacity remains. Any further delays after one year require approval from the State director. After beginning, all closure activities must be completed within 180 days (with the exception of an extension from the state director). After closure is complete, the owner/operators then must certify that the closure has been completed in accordance with the official closure plan. This certification must be signed by an independent, registered professional engineer or the State director. At this time, the MSWLF owner/operators also must make a notation on the property deed indicating that the land was used as a landfill and that its future use for other activities is restricted.

## Post-Closure Care

Post-closure care activities consist of monitoring and maintaining the waste containment systems and monitoring groundwater to ensure that waste is not escaping and polluting the surrounding environment. The required post-closure care period is 30 years from site closure, but this can be shortened or extended by the director of an approved state program as necessary to ensure protection of human health and the environment. Specific post-closure care requirements consist of maintaining the integrity and effectiveness of the:

- Final cover system
- Leachate collection system
- Groundwater monitoring system
- Methane gas monitoring system

The owner/operator of a closed MSWLF must prepare a written post-closure care plan that provides:

- A description of all required monitoring and maintenance activities, including the frequency with which each activity will be performed
- The name, address and telephone number of the person to contact during the post-closure care period
- A description of planned uses of the land during the post-closure care period

Any use of the land during this period must not disturb the integrity or operation of any of the waste containment systems or the monitoring systems. At the end of the post-closure care period, the owner/operator must certify that the post-closure care has been completed in accordance with the official post-closure care plan. This certification must be signed by an independent, registered professional engineer or the State director. Once signed, the certification is placed in the facility's operating record. | **WA**

—[www.epa.gov/osw/nonhaz/municipal/landfill/financial/mswclose.htm](http://www.epa.gov/osw/nonhaz/municipal/landfill/financial/mswclose.htm)

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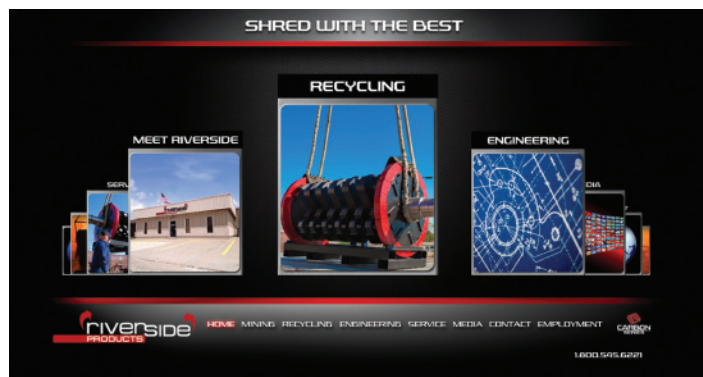
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RIVERSIDE PRODUCTS, INC. (Bettendorf, IA), supplying metal recycling shredders and custom engineered wear parts, has recently launched a new Web site. The launch is just one feature of the new branding by Riverside Products that has included newly developed print collateral and video. The fresh and technologically advanced Riverside Products Web site will be fully accessible through both computer and mobile devices. The mobile version holds a touch screen feature, which will allow the viewer to easily navigate the entire Web site by the simple swipe of a finger. Visitors of the Web site will notice the carousel layout of revolving images making the Web site visually appealing, straight forward, and easy to navigate.

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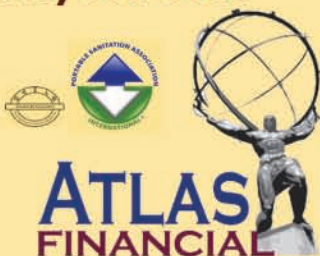
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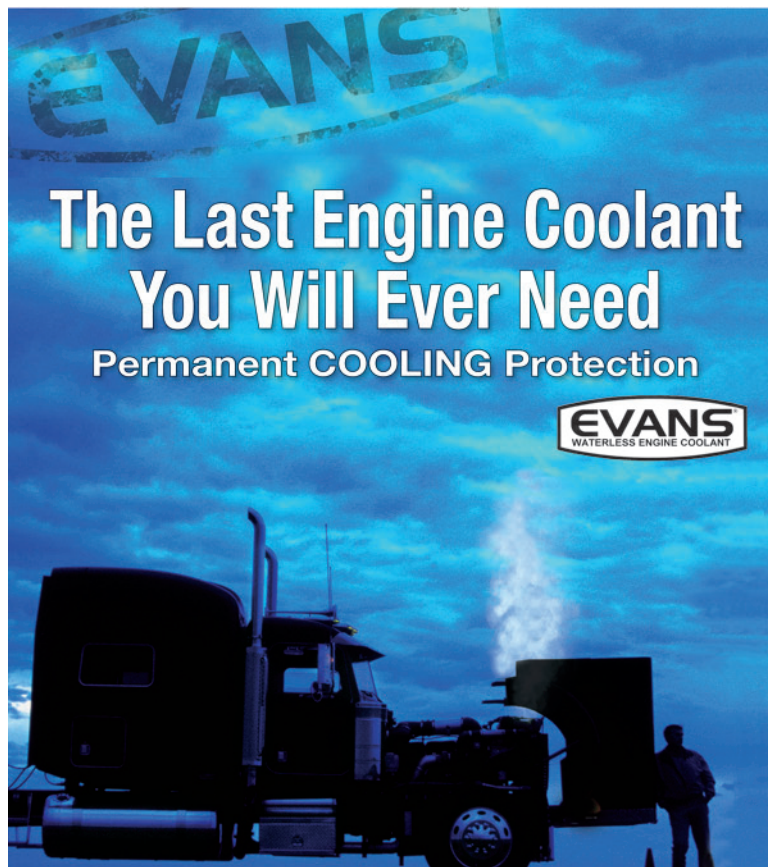
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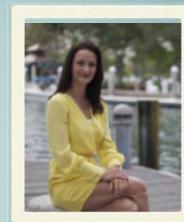
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