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www.wasteadvantagemag.com April 2012 Vol.3, No.4

WasteAdvantage

magazine

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ITS COMMUNITIES'
"GO TO" WASTE AND
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Editor's Note



IT'S ALMOST SHOW TIME! THE WASTE EXPO IS JUST AROUND THE CORNER

and we are putting the final touches on our preparations. Anticipation is in the air and plans are being made to see old friends, meet new ones and speak with as many people as possible while there. Before you get to the show, check out www.wasteadvantagemag.com to see a list of our advertisers and their booth locations. There are a few highlighted company profiles to review as well, so you'll be even more prepared when the first day of the Waste Expo finally arrives.

Our fantastic April issue is packed with great articles designed to get you thinking about pertinent issues in the industry, such as the "Econometric Modeling of Waste" (page 22 which examines the interrelationships between the economy, regulatory policies, shifts in material science and downstream waste generation, or "The Importance of Landfill Gas Energy in Integrated Municipal Solid Management in the Developing World" (page 35) that discusses the proper mix of ISWM and LFG energy to protect human health and the environment. In addition, check out "Fast Forwarding Fabric" (page 31) which focuses on how tension fabric buildings have rapidly evolved, "Finding the Right On-Board Scales for Your Application" (page 40), which will help you choose to right scale system to maximize your loads and "Rail Negotiating Best Practices" (page 48), preparing you by planning and analyzing your situation.

There are also two spotlight articles this month. The first focuses on Apple Valley Waste in Kearneysville, WV, a company that has focused not only on aggressively growing the business in the Mid-Atlantic region, but is also determined to be its communities "go to" waste and recycling resource. Read about some of the methods used to communicate with the employees as well as the communities served (page 15). The second spotlight is on the winner of the first Safety in Motion Award, created by Preco Electronics. Rumpke's Director of Corporate Safety, Larry Stone, has gone above and beyond in his role with regards to safety. Turn to page 51 and find out why.

Be sure to stop by booth #13220 at the Waste Expo in Las Vegas to speak with us about an issue, article, technology or just something cool that you've seen around the show floor or otherwise. And while you're there, you can enter the drawing to win a chance to drive more than 165 MPH on a Super Speedway in a real stockcar at the Dale Jarret Racing Adventure. We look forward to seeing you at the show!

Best Regards,

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On the Cover:

Apple Valley Waste's mini roll-off service. The 15yd roll-off boxes work great for homeowners and contractors alike.

Photo courtesy of Apple Valley Waste (Kearneysville, WV).

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VEOLIA ENVIRONMENTAL SERVICES NORTH AMERICA CORP. (Chicago, IL) announces it has joined the U.S. Department of Energy's (DOE) Clean Cities National Clean Fleets Partnership program. The objective of the partnership is to engage companies that operate large fleets in multiple states to work with the DOE's Clean Cities initiative to reduce overall petroleum consumption.

The initiative provides fleets with specialized resources so that they can successfully incorporate alternative fuels and fuel-saving measures into their operations. The National Clean Fleets Partnership was developed with input from fleet managers, industry representatives and the DOE's Clean Cities coordinators. It is open to fleets that own or have contractual control over at least 50 percent of their vehicles and have vehicles operating in multiple states. The company then works with the Clean Cities organization to develop a petroleum use reduction strategy that meets its needs and goals.

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ES Consultants Joins SCS Engineers

ES Consultants (Miami, FL) became part of **SCS ENGINEERS** (SCS) (Long Beach, CA) on March 1, 2012. ES Consultants now operates under its new name, SCS ES Consultants. Prior to joining SCS Engineers, ES Consultants was most widely recognized for its excellence in combining their staff's environmental and civil engineering expertise to deliver "out of the box" cost-effective solutions for client developments on contaminated properties, including former solid waste landfills, government facilities and public recreation areas. As SCS' new South Florida presence, SCS ES Consultants will continue to be leaders in the environmental and civil engineering fields.

For more information about SCS ES Consultants, call (305) 412-8185. For more information about SCS Engineers, e-mail service@scsengineers.com or visit www.scsengineers.com.

Martin Dareff, GSA Manager for Miami-Dade County, FL, Retires After 29 Years

After 29 years of service to the **MIAMI-DADE COUNTY FLEET MANAGEMENT DIVISION**, Martin Dareff has thrown in the towel, retiring to enjoy some personal time and pursue other interests outside of his career. Officially leaving the county on April 10, Dareff reflects over a long and productive career in fleet management, part of that being in waste collection. "In two blinks my career has flown by, but I have no regrets," he says. "I made the best out of the hand I was dealt and they were great years."

Moving to Florida with his family in 1964 in order to go to the University of Miami and get out of the cold weather of Brooklyn, NY, Dareff took engineering, marketing and business courses, graduated in 1969 and went into the retail sales business at a now-defunct department store chain. Deciding that retail was not the direction he wanted to take in life, Dareff took a job at Greyhound Rent-A-Car. Starting as rental agent/trainee, he soon wound up as a regional manager with 2/3 of the company's operating mass under his control. However, after 11 years of working for the company, they were sold and virtually everyone in management moved on.

Dareff bounced back and took the opportunity to work for Miami-Dade county as a warranty administrator, where he was able to steadily rise through the ranks, overtaking contract management for commodities and services and

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Trash Talk

eventually moving into the position he held—the review and approval of all of the mobile equipment acquired by the county (with the exception of transit route bus coaches and fire equipment). Not only did he maintain and monitor 100 contracts that were used in 29 facilities countywide to acquire all the goods and services required to support a fleet of between 10 and 11,000 powered units, but he also designed, serviced, and decaled new equipment and put up the fleet for auction disposal according to State regulations. “Full-service, you name it, we did it—from executive lease vehicles for county commissioners to automated loaders and everything in between. I wrote the specs for every piece of solid equipment that’s been purchased in the last 25 years,” says Dareff. In addition to his job at the county, Dareff was also on the Editorial Advisory Board of *Municipal Solid Waste Magazine* for several years, wrote for a few publications, including *Waste Advantage Magazine*, and attended numerous tradeshows, throughout the years. He also holds the 868th certification for Certified Public Purchasing Officer ever issued and is Lifetime Certified from the Universal Public Purchasing Certification Council.

Now in his 29th year with Miami-Dade County, he is ready to retire and take a break from a long career and pursuing his passions, such as photography and travel, and just enjoying some time to read, listen to music, go the movies, etc. However, he does mention that he would certainly consider consulting in 2013 and possibly going for his Certified Financial Analyst Certification, having been a stock market student for about 3 years. However, for now, Dareff points out that he has a number of things to do. “I have to get my place sold; I’d like to move to Fort Meyers. I’m also thinking about going to Thailand for

a couple of months this summer. My future wife is there so I am going to visit and bring her back. I’ve been working since my 2nd semester of my sophomore year in college and have not stopped—45 years now. It’s going to be nice to know what it’s like to get up in the morning and not have to do anything.”

To contact Martin Dareff, e-mail midareff@gmail.com.



GSA Director, Wendi Norris (left) with Martin Dareff. Photo courtesy of Miami-Dade County.

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MAY 2012

16 – 17: Anaerobic Digestion Conference and Expo

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www.renewable-waste.com

20 – 23: 2012 New York Federation of Solid Waste and Recycling Conference and Trade Show

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Lake George, NY
<http://nyfederation.org>

JUNE 2012

3 – 6: Safety 2012

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www.asse.org

4 – 6: Illinois Recycling and Waste Management Conference and Trade Show

Clock Tower Hotel and Conference Center
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www.illinoisjointconference.com

12 – 13: Waste Conversion Congress East Coast

Radisson Plaza-Warwick Hotel
Philadelphia, PA
www.renewable-waste.com/waste-conversion-east

19 – 20: Biogas USA East and Midwest

The Mid-America Club
Chicago, IL
www.greenpowerconferences.com

21 – 24: Air & Waste Management Association 105th Annual Conference and Exhibition

San Antonio Convention Center
San Antonio, TX
www.fivesenses.com/ee6

24 – 26: 2012 Summer Conference

Sawgrass Marriott
Ponte Verde, FL
www.swanafl.org

JULY 2012

13 – 17: National Association of Counties (NACo) Annual Conference and Exposition

David L. Lawrence Convention Center
Pittsburgh, PA
www.naco.org

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

Lancaster Convention Center
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Government Gossip



Florida Legislature Passes Key Solid Waste Legislation

The Florida Chapter of the NSWMA applauds the passage of two pieces of key solid waste legislation by the Florida Senate and House of Representatives during the 2012 legislative session. NSWMA is hopeful that the bills will be signed into law by Florida Governor Rick Scott. The first bill supported by the NSWMA was H.B. 503 by Rep. Jimmy Patronis (R-Panama City). This bill is a major rewrite of the environmental permitting laws that includes language that will double the term of permit extensions for solid waste management facilities with leachate collection systems from 10 to 20 years. Those facilities without leachate collection systems would be able to extend their permit terms from 5 to 10 years.

The other passed legislation on the Chapter's Session Priority list was HB 7003 by Rep. Steve Crisafulli (R-Merritt Island). This bill creates a statewide Environmental Resource Permitting system. This legislation will give consistency to the five DEP districts when it comes to the permitting process. Each bill is consistent with legislative intent to require regulations to be effective in protecting the environment, not just burdensome to industry.

For more information, visit www.environmentalistseveryday.com.

New E-Waste Policy For Federal Government

The U.S. General Services Administration's Office of Government-wide Policy released a bulletin outlining new guidelines banning all federal agencies from disposing of electronic waste in landfills. This is an important step for the federal

government as it moves to incorporate the responsible use and disposal of electronics that were outlined last summer in the National Strategy for Electronic Stewardship.

Under the new policy, reusing electronics remains the priority. Asset managers will first offer these products for reuse by other agencies. Then they will seek to donate them to schools, non-profits, and local governments or offer them for sale. For non-functioning items that must be disposed of, federal agencies are now banned from sending these materials to landfills or incinerators; instead, they will recycle them with third-party certified e-waste recyclers. The policy also encourages recipients of used government electronics to follow the same reuse and recycling standards as the federal government.

The policy incorporates the use of recyclers certified under R2 and e-Stewards because these third-party standards have already been adopted by the electronics recycling industry as environmentally sound. A recycler must be certified to at least one of the two standards. Certified recyclers are regularly audited by these certification entities to ensure that electronics are processed in a manner that protects public health and the environment.

Transparency and accountability are a crucial part of the policy, and GSA is asking federal agencies to track the final destination of their discarded electronics. Starting in 2012, the GSA will start to more effectively account for every device leaving the government, including where each one goes, then the information will be reported to the public on Data.gov.

The federal government as a whole is the nation's largest consumer of electronics. The policy gives them the opportunity to lead by example and become a more responsible user of electronics while supporting jobs in the growing e-waste industry.

For more information, visit <http://gsablogs.gsa.gov/gsablog/2012/03/07/new-e-waste-policy-for-federal-government>.

EPA Issues 2011 Fuel Economy Trends Report

The average fuel efficiency for new cars and light duty trucks has increased while the average carbon dioxide (CO₂) emissions continue to decrease for the seventh consecutive year, according to the EPA's annual report, "Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2011."

For 2010, the last year for which EPA has final data from automakers, the average real world CO₂ emissions from new vehicles were 394 grams per mile and the average fuel economy value was 22.6 miles per gallon (mpg). EPA projects an improvement in 2011, based on pre-model year sales estimates provided to EPA by automakers, to 391 grams of CO₂ per mile and 22.8 mpg. Fuel economy will continue to improve significantly as part of the Obama administration's historic standards that will reduce greenhouse gas emissions and increase fuel economy to 54.5 miles per gallon by 2025.

The U.S. Department of Transportation and EPA are implementing the first phase of these standards that already improved fuel economy in 2010 and will raise fuel efficiency to 35.5 mpg by 2016. These standards will save American families \$1.7 trillion dollars in fuel costs, and by 2025 result in an average fuel savings of over \$8,000 per vehicle. Additionally, these programs will dramatically cut the oil we consume, saving a total of 12 billion barrels of oil, and by 2025 reduce oil consumption by 2.2 million barrels a day—as much as half of the oil we import from OPEC every day.

For more information, visit www.epa.gov/otaq/fetrends.htm.

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Apple Valley Waste: Its Communities' "Go To" Waste and Recycling Resource

In a position to execute an aggressive growth plan in the Mid Atlantic-Region, APPLE VALLEY WASTE IS EXCITED TO CONFRONT CHALLENGES AND ARE INSPIRED BY THE SUCCESSES AND FAILURES in their past in order to do things the right way.

IN 2006, J.P. PHILLIPS AND RANDIE LAWSON found that they had an opportunity to start Apple Valley Waste (AVW) (Kearneysville, WV) by purchasing Waste Management's residential business in Martinsburg, WV, worth about 7 million dollars in revenue with 27,000 customers. After completing the acquisition, AVW grew at a steady pace through 2010. It was in that year that Phillips, Lawson and John Decker began talking about transforming the business. As a result, Decker brought Summer Street Capital (Buffalo, NY) to the table to help finance the new direction of AVW. The transaction was completed on December 30, 2010 at which time Lawson retired from AVW and Decker signed on as Managing Partner and CEO. Says Phillips, "The strategic partnership with Summer Street really gave John and I the opportunity to grow. They are a great financial resource, both from

a monetary standpoint and evaluation, advice, etc. Summer Street makes the company well-balanced and financially sound, positioning Apple Valley Waste for strong Mid-Atlantic growth."

Since the partnership, the company has grown substantially, from servicing only subscription residential customers to now servicing more than 40,000 households and hundreds of commercial and industrial customers (including roll-off, commercial front load, recycling, etc.). With 58 employees and a fleet of 30 trucks, AVW provides residential collection in Berkeley and Jefferson Counties in WV and Washington County, MD with residential, commercial and industrial services in that county.

Expanding the Business

Economic conditions have been slow but steady since 2009. Yet, Apple Valley has been able to take



Apple Valley rearloader in Washington County, MD.
Photos courtesy of Apple Valley Waste.

Apple Valley Waste: Its Communities' "Go To" Waste and Recycling Resource



Apple Valley Waste headquarters in Kearneysville, WV.

advantage of some acquisition opportunities to expand the business in West Virginia and Maryland. They have closed on four acquisitions since 2009 and already executed Letter of Intent for 2012. Decker, says, "We recognized that the economy was going to be struggling or flat for a while so we knew we had to grow the business in other ways. Even though we have seen very few new businesses opening up or new people moving into our area, we have been very successful in expanding our business by introducing new products and

services to our current customers." In 2009, AVW introduced mini 15-yard roll off boxes and marketed them to their customers as a solution to small construction, clean-up projects. The success of this line of business has exceeded their wildest expectations. It has now grown into a full-time division of the company. In 2011, AVW started offering 30-yard roll-offs more for commercial and industrial-type customers. "It's been a great addition so far," says Phillips. "We are very pleased." AVW went on to introduce the BIG HANDY BAG™ during the summer of 2011, which offers a solution for customers who have too much material for their regular pickup, but not enough to fill a roll-off box. Phillips points out that from the feedback they received during the last half of 2011, he expects big things in 2012.

In addition to having a long-standing single stream curbside program in Jefferson County, WV servicing over 12,000 homes, AVW was also the first company to introduce single-stream recycling to Washington County, MD when it started its program in 2010. Now, thanks to the help of the Berkeley County Solid Waste Authority, in March 2012 AVW revitalized curbside recycling in Berkeley County by implementing a large-scale program that gives customers the ability to have their recyclables picked up curbside.

Keeping a Culture of Trust

A real challenge that AVW is aware of and that they will be facing in the future is their ability to continue to keep the same culture of company trust, family atmosphere and very strong relationships with the communities they serve as they expand the business. "J.P. and I are both aware that these things have been a key to our success and they differentiate us from our competitors every day. We are determined to not let our growth and/or the geography of our company be a convenient excuse as to why we left these beliefs and values behind. We have both been in circumstances at large organizations where we have seen these 'invaluable assets' lost in multiple layers of management," says Decker. "We owe it to the people who rely on us not to let it happen here."

The close relationship with the employees and the commitment to the community are two things that Apple Valley Waste never wants to jeopardize. But doing so takes work and effort. For example, the company's annual Christmas party is a great topper to the end of each year. "This year we had 175 people attend—about half of them were kids. We pride ourselves on creating a different type of company and Christmas party—we want the kids there. Santa attends and all the kids walk away with a gift. We figure our employees spend

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Company Philosophy

"Our community is the key to our success. It sounds like a simple straightforward comment, but when we speak of 'Our Community', we speak first about our 'Apple Valley Community' and feel very strongly that our success begins from within. Many say how important their employees are, but we make sure our employees know it. We do not take one minute of their time or one ounce of their commitment for granted. We work hard to ensure that our culture is built from the way we take care of our employees, to the way take care of each other and finally to the way we all collectively take care of our customers.

"We see our friendships in the industry as the key to our future and recognize that the relationships we maintain will lead to the opportunities that will define us. Good relationships are hard work. There are so many challenges today that require you to make tough choices about what kind of partner you are going to be. Too many people take the easy way out or find a convenient excuse as to why they could not do the right thing 'this time'. But we do not believe that you get to take a time out from your commitment as a partner. We understand that our partners (our employees, vendors, regulatory agencies and the communities we serve) are relying on us as much, if not more, so then we are relying on them. By delivering on their expectations each and every time, we create a loyalty that will lead to new opportunities.

"At no other time in the many years we have spent in this business has innovation played such a key role. From the efficiency of our collection and processing equipment to the transformation of our waste stream into new resources, ideas are defining the way our industry will look tomorrow. We believe that the ultimate level of our success will be directly influenced by how innovative our people are. But we also believe that innovation begins with leadership. Too many people measure themselves as leaders by the titles that they hold or their span of control. Our view is very different. For us, we feel that as leaders we must lead by example and recognize that we become true leaders when we really serve those who rely on us. When our people completely trust us as their leaders, then they will be comfortable enough to become innovative and take risk."

— John Decker, CEO of Apple Valley Waste



At Apple Valley's 2011 Christmas party. Santa reads the poem "Twas the night before Christmas".

more time with us than they often do with their families, so it's nice to have that one time per year where their families and ours come together so we can give something back to them for all they do. It's a really great time," says Phillips.

All of the employees also go through safety meetings on a monthly basis and the company holds quarterly gatherings with any staff that are in safety-sensitive roles—drivers, maintenance people, etc. Decker points out that not only has the company recently held a CPR training class that was open to anyone who wanted to attend, but they also hold offsite dinners with the team just to get them away from the shop for a while and allow them to talk about anything that might be on their minds or concerning them. "It's a great opportunity for safety issues to be brought up and just to get to know each other better. You often find you have many things in common and these get-togethers continue to build our Apple Valley community," says Decker.

Decker is particularly proud that they also perform an annual self-OSHA audit, where they hire someone to come in from the outside and hold a mock OSHA audit in order to make sure everything is in the best shape it can be. "These are great checkpoints because we get so used to our environment and looking at the same things every day that sometimes potential problems do not catch your attention. It's a valuable self-check for someone to point those out to you so we can provide a safe place for our people."

Giving Back

One of AVW's policies is to be the best resource for its communities. A quarterly newsletter is sent out with each customer invoice that details service offerings, company events and informs everyone about the things that are happening around the community. AVW also tries to take advantage of every opportunity to listen to the communities, political leaders and solid waste authorities they serve. "Our goal is to be their 'go to' resource. Whenever any question or need pops up in the area of recycling or refuse collection, we want them to think about contacting or partnering with us," says Phillips. "We really try to be there for them to share our experience or knowledge and provide whatever support they may need. It also is a great opportunity for us to learn."

AVW participates in community events and works hard to give back to local organizations. For example, when the Christmas trees are collected every year, any money made from the collections gets donated by AVW to the local Boys and Girls club. A couple of years ago, AVW also teamed up with the Jefferson County Fair Association to start a recycling program at the fair. Phillips says, "Working with the officials at the fair helped that program really take off, especially this year. We have been able to divert a lot of material out the waste stream at the fairgrounds by adding single-stream recycling bins." AVW also participates in the livestock auctions for the Future Farmer's Association. Here, kids raise cattle and hogs to sell. AVW is a regular at these events and every year purchases livestock to help continue the program. One recent example of

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—Dennis Pratt, fleet manager, City of Fayetteville

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joint success being driven by good community relationships is the work AVW and the Berkeley County Solid Waste Authority have done together to provide curbside recycling collection to more than 20,000 residents where it didn't exist before. "Collectively, we have now been able to offer everyone in the county a curbside recycling program to go with the electronics recycling dropoff/pickup that we started last year—these are all accomplishments that have been realized in conjunction with the county," says Phillips. "While we are a business, there are times when a company in order to be truly successful cannot be motivated by just money or profits. We do it because we believe it is the right thing to do."

Says the Chairman of Berkeley County Solid Waste Authority, Clint R. Hogbin, "Apple Valley Waste Services entered our county amid years of poor solid waste collection services within our community. Their management quickly recognized the outstanding service issues and worked to resolve them. Equally important, they established a no hidden agenda openness with the members of the Berkeley County Solid Waste Authority that was based on an understanding that the service needs of the community was on equal footing with the profits of the company. As a long-standing board member, it was clear to me from the beginning they offered a fresh approach. As a result, historical quality of service issues were addressed, new recycling and usage rate opportunities appeared overnight, approved county solid waste plans were taken seriously and a comprehensive new approach to solid waste management developed."

Inspired By Challenges

According to Decker, the biggest challenge that he sees in the Waste Industry today is also one of the biggest challenges that the U.S. is facing—

the development of new, innovative and better ways of doing things needing to reach a point where they are as efficient and cost-effective as traditional methods. "In today's economic environment, no matter how strong your desire to do something better, it becomes increasingly difficult to accomplish when doing so simply costs a lot more. For example, waste-to-fuel, solar, wind power, organics collection and processing are all great ideas to explore for our future, but we have to consider how much more we can ask customers to pay to support initiatives during a time when many of them are simply trying to make ends meet?" says Decker. "At AVW we are trying to be as thoughtful and innovative as we can right now—offering our customers the services they desire supported by doing it the right way as much as possible. But you have to pick your spots. You can never be everything to everyone, especially right now. We try to offer our employees, customers and communities all the best things we can for the best value; when choices have to be made, we make them collectively so that everyone buys in together."

Going forward, AVW's relationship with Summer Street Capital has positioned them extremely well to execute on an aggressive growth plan in the Mid Atlantic-Region and take on the challenges of today and tomorrow. "We are excited about the road in front of us and are inspired by the successes and failures in our past," says Decker. "We know now what 'the right way' is, and have made that 'The Apple Valley Way'. Our goal is simple, to be the "go to" waste and recycling resource in all of the communities we serve." | **WA**

For more information on Apple Valley Waste, contact J.P. Phillips at (304) 724-8640 or e-mail Jp.phillips@applevalleywaste.com.

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ABOVE TOP OF
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WDNOT109

NOTICE
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RECYCLABLES
ALLOWED

WDNOT103

NOTICE
CONTAINER MUST BE
PLACED ON HARD,
LEVEL SURFACE
LOAD UNIFORMLY

WDNOT112

NOTICE
IT IS AGAINST THE LAW
TO PUT HAZARDOUS OR
TOXIC WASTE IN THIS
CONTAINER

WDNOT113

NOTICE
ALL TRASH MUST
BE PUT IN THE
CONTAINER

WDNOT106

NOTICE
PLEASE
CLOSE COVERS

WDNOT116

NOTICE
NOT FOR
PUBLIC USE
VIOLATORS WILL
BE PROSECUTED

WDCAU101

CAUTION
DO NOT PLAY IN, ON
OR AROUND OR OCCUPY
THIS CONTAINER FOR
ANY PURPOSE

WDCAU106

CAUTION
KEEP HANDS
CLEAR OF THE
HOPPER

WDCAU111

CAUTION
KEEP
OUT

WDCAU114

CAUTION
THIS COMPACTOR
STARTS
AUTOMATICALLY

WDCAU115

CAUTION
BEFORE OPENING DOOR
TURN CONTROL PANEL KEY
SWITCH TO OFF POSITION,
REMOVE KEY AND
BLOCK OFF TRASH CHUTE

WDCAU116

CAUTION
THIS BALER
STARTS
AUTOMATICALLY

WDCAU122

CAUTION
DO NOT PLAY
IN OR AROUND

WDDAN103

DANGER
STAND CLEAR
WHEN TAILGATE
IS OPEN

WDDAN102

DANGER
STAND CLEAR
WHEN CONTAINER
IS OFF GROUND

WDDAN104

DANGER
FREQUENT STOPS
AND BACKING

WDDAN105

DANGER
DO NOT
ENTER

WDDAN107

DANGER
DO NOT PARK IN
FRONT OF THIS
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Econometric Modeling of Waste: The Value Proposition in an Uncertain Economy

Navid Nowakhtar

Examining the interrelationships between the economy, regulatory policies, shifts in material science and downstream waste generation can be done within an ECONOMETRIC FRAMEWORK THAT IS TIME-TESTED AND NEARLY UBIQUITOUS IN OTHER AREAS OF UTILITY PLANNING.

THE CURRENT ECONOMIC TURMOIL WE ARE experiencing as a nation is no secret. Everywhere you turn, there are statistics that show a relatively weak economy that has only begun to recover from the sharpest downturn since the Great Depression. Uncertainty in the general economy is at a near all-time high, and these conditions have a direct impact on the timing and amount of tonnage flowing to landfills and diversion facilities. This places a tremendous amount of pressure on communities that rely on revenues from tipping fees to support waste management programs.

For waste management companies and landfill operators, capacity may be more than adequate to meet the needs of today, but a greater long-term emphasis on waste reduction and prudent management will also demand a more detailed analysis that examines all of

the interrelationships between the economy, regulatory policies, shifts in material science and downstream waste generation. Such planning can be done within an econometric framework that is time-tested and nearly ubiquitous in other areas of utility planning.

The Economy and Waste Generation: A Snapshot

The nation is experiencing the highest unemployment rates since the Great Depression, according to data from the Bureau of Labor statistics and IHS Global Insight. No individual sector can claim to have been spared from this softness in labor markets. Florida and California have been especially hard hit areas, with rates hovering around 12 percent for 2010 in both states. The national

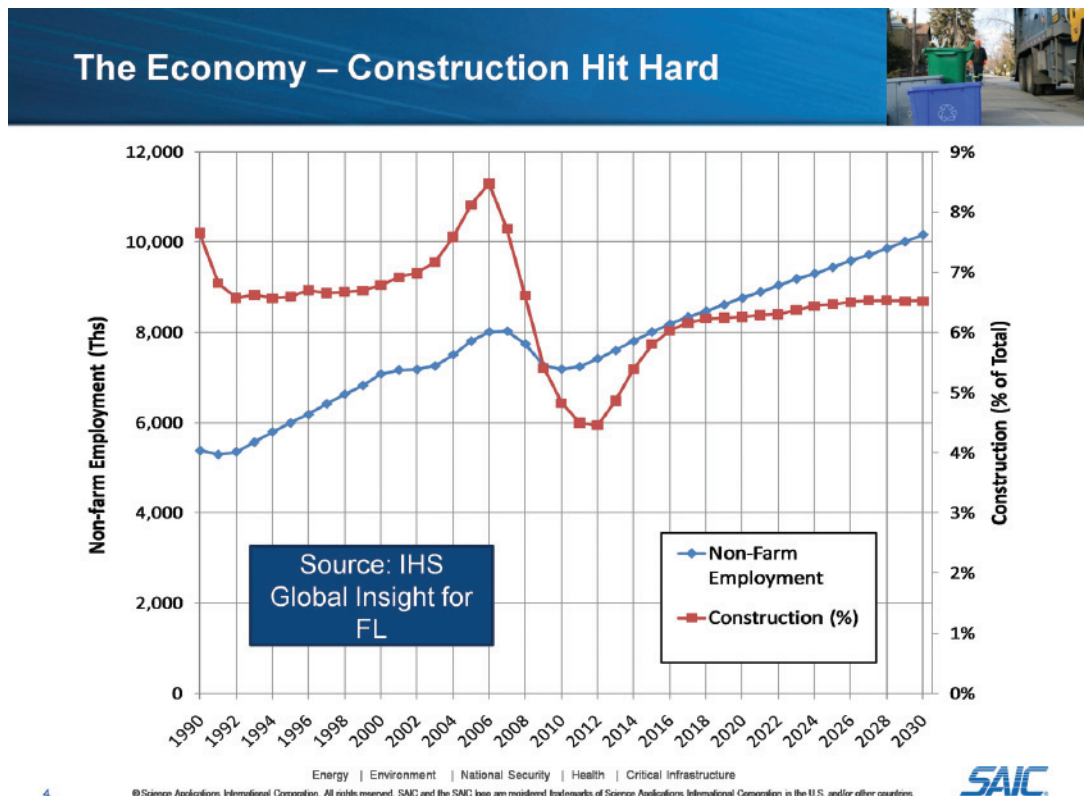


Figure 1: Construction employment. Figures courtesy of SAIC.

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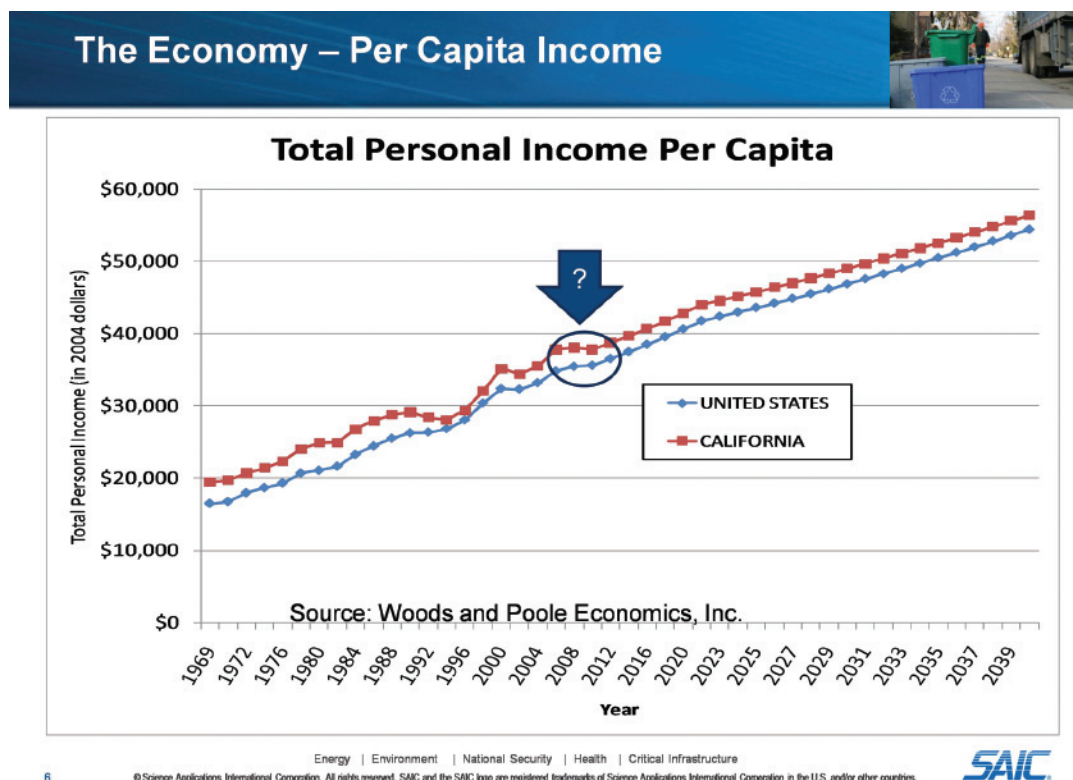
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Figure 2:
Personal income per capital.



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unemployment picture has improved somewhat, declining to around 8.5 percent as of December 2011 based on data compiled by the U.S. Bureau of Labor statistics. However, this is far from enough job gains to undo earlier losses, and does not account for discouraged workers who have stopped actively seeking work.

Construction employment, a key driver of construction and demolition (C&D) waste tonnages, has especially been hit hard as a result of the housing crisis, which has caused builders to delay construction projects or abandon them altogether. **Figure 1, page 22** compares historical and projected IHS Global Insight® (HIS Global Inc.) data on non-farm versus construction employment. According to the Associated General Contractors of America, data from May 2011 (the most recent available) offers little encouragement on the national front, as construction spending in May reached an 11-year low.

Housing prices have plunged, resulting in a significant reduction in overall wealth of the average consumer. The average price for homes in the U.S. has plummeted, based on data maintained by the U.S. Census Bureau and IHS Global Insight. The recovery period for equity could be as protracted as 20 years. Recent initiatives like the Home Affordable Refinance Program are expected to have a small impact in 2012, as buyers in good standing take advantage of lower interest rates, leaving more money to boost consumer spending.

The news is not that much better for incomes, although slow and steady growth is anticipated, as shown in **Figure 2**, which is based on data from Woods and Poole Economics, Inc. Incomes have barely kept pace with inflation, and Americans have been seeing retail prices rise at an annualized rate of more than 5.6 percent during the first half of 2011 according to the Bureau of Labor statistics. In total, more than 15 percent of the population lived in poverty in 2010, the highest percentage since 1993, according to the most recent data from the Census Bureau.

Example County Output

Capacity Projection Model Disposal Projection

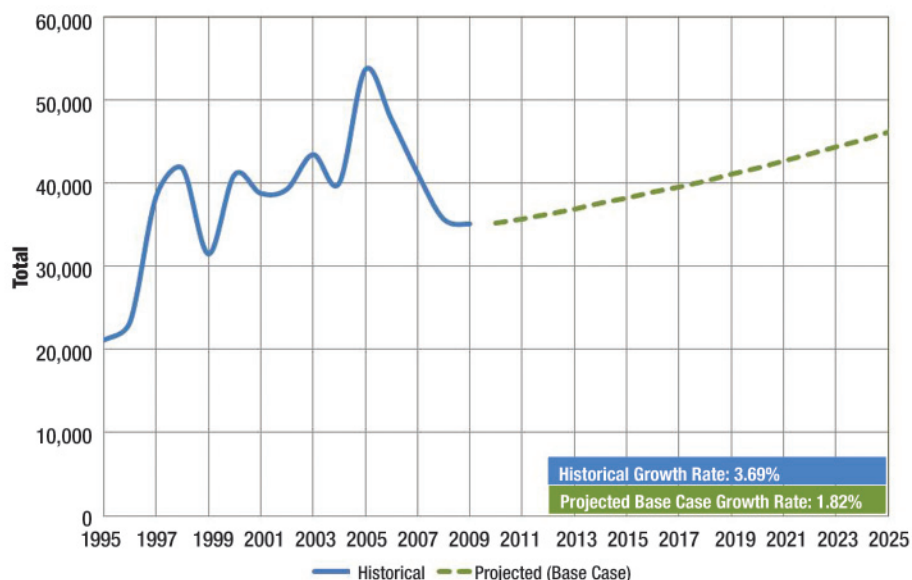


Figure 3: Example econometric output.

At the same time, product manufacturers have been encouraged to minimize packaging of products and engage in source reduction to reduce waste. Various incentive-based price discrimination schemes and/or laws, including, for example, pay-as-you-throw structures and extended producer responsibility, are in place that represent a paradigm shift in how customers interact with the waste management industry. An example of recent activity in this realm is New York's statewide electronics waste recycling law, which took effect in January 2012, and prohibits waste haulers from collecting e-waste unless it is destined to be recycled or reused.

The microcosm of the C&D industry corroborates these macroeconomic findings. According to two recent reports, one in Virginia and one resulting from an extensive C&D waste characterization study in the state of Georgia¹, the economy and the health of waste flow are linked undeniably. According to a recent report by the Virginia Department of Environmental Quality, C&D tonnages declined by 25 percent from 2006 to 2009, primarily due to a combination of a soft economy as well as an increase in Virginia's recycling

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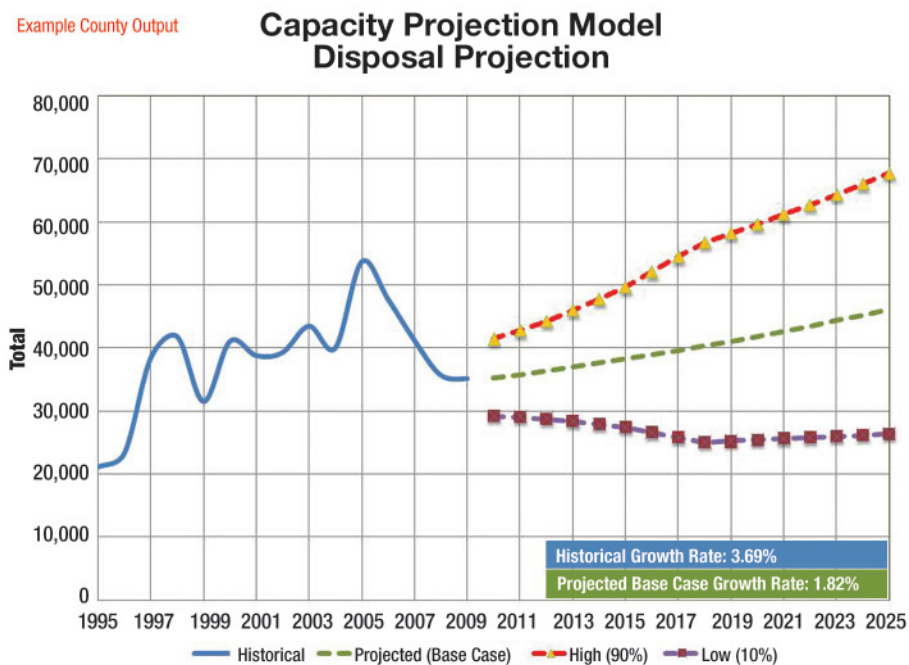


Figure 4: Full econometric output with risk bands.

rate from 38.5 percent in 2009 as compared to 29.8 percent in 2004. In Georgia, C&D disposal was 23.6 percent lower in fiscal year 2008 as compared to fiscal year 2007, while municipal solid waste (MSW) tonnages remained somewhat flat. This critical component of the waste stream cannot be ignored and, more importantly, cannot be forecasted using simple trending techniques. The Virginia report cites that the estimate for remaining available landfill capacity for C&D is 20.5 years at current rates of throughput. However, what if markets, population and employment fluctuate?

The takeaway from all of this empirical data is simple: communities and municipalities can no longer afford to rely on an oversimplified extrapolation of historical trends as a reliable predictor of potential futures. Doing so, or even combining such an approach with certain other existing techniques, carries with it considerable risks that can better be managed with a more data-intensive econometric modeling framework.

What Are the Risks?

Following is a sampling of potential risks of the status quo approach.

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Revenue Projection Uncertainty

Certain communities rely on tipping fee revenues from the operation of facilities. The error in projected or anticipated revenues resulting from simply extrapolating historical trends can be fairly damaging within the context of budget projections.

Overplanning/Underplanning for Disposal and Diversion Capacity Needs

Without a solid understanding of the range of potential futures for waste generation and disposal, communities and waste management stakeholders may (in the long term) either overplan or underplan for capacity within their system and be forced to rely on waste export markets outside their system, presumably at a hefty tip fee premium that must then be passed through to customers.

Inability to Properly Capture or Quantify the Impact of Various Recycling Initiatives on Historical and Future Disposal

By ignoring such market dynamics through simple trending, it becomes impossible to determine whether such policies have persistent, statistically significant impacts on future behavior. If such policies do matter, then a model that assumes measurable impacts will tend to perform better in terms of providing reasonable planning projections of future throughput.

Inability to Experiment with Pricing Structures for Disposal Services to Determine Price Responsiveness

Price elasticity (or the “responsiveness” of consumer behavior as a function of price) as it relates to waste disposal rates and the impact of rising fees to both residential and commercial consumers can be tested in an econometric framework. Assuming the availability of requisite historical information, the model can isolate the impact (if any) of changes in price on disposal behavior.

Omitted or “Unknowable” Variable(s) May Be Driving Short-Term Trends

A more short-term (generally less than five years) view of the drivers of future trends may be subject to undue influence from various omitted or “unknowable” variables that cannot be measured. A longer-term data set allows a modeler to fully tease out a consistent and stable relationship from short-term fluctuations.

“Rules of Thumb” Consider Only Near-Term Reality and Not Longer-Term Relationships

Rules of thumb are generally only based on recent-term expectations and, more importantly, may not be representative of your particular solid waste system.

Existing Forecasting Methods

Now that we know the risks, let’s take a look at the existing methods of forecasting, some of which can be very useful complements to an econometric approach.

EPA Estimations/Fact Sheets and Rules of Thumb

In this approach, a per-capita generation or disposal rate is extracted from some source or through intuitive experience. In the absence of appropriate

historical data, this approach can be a useful high-level planning technique. The key weaknesses of this approach are that such rules only consider the near-term situation and may not be representative of any particular system due to their lack of granularity. There is also no ability to perform scenario analysis.

Linear Trending

This method is as straightforward as it sounds (no pun intended). It does not attempt to explain variation in history, and leaves the user with no ability to perform scenario analysis.

Linear Trending with Rules of Thumb Benchmarking

This is a superior approach to either method 1 or method 2, as there is at least some form of benchmarking that can be done in terms of overall sensibility of the linear trending as compared to aggregated ballpark estimates.

Local Community-Based Views or Other Interview-Based Techniques

Interviews and insights regarding local conditions are a sound way to bolster the believability of any projection—no one knows more about local conditions than local officials. It is important to note that maintaining objectivity when gathering feedback can be a challenge, and it is critical to balance local perspectives with objective data.

Unit Elastic Approach

In this method, the future of waste generation or disposal is tied “one-for-one” with a particular economic variable, such as population or income. The key strength of this method is that it does allow the user to perform various “what-if?” scenarios based on the range of potential futures. However, a big weakness of this approach is assuming a one-for-one (or unit elastic) relationship without examining the validity of that assumption throughout history.

Generation Rate Study/Audit

Communities frequently engage in generation rate studies that involve random sampling of homes in the system to audit the amount of waste generated per week for either disposal or diversion and then use such estimates to extrapolate to the entire system and potentially for use in forecasting future tonnages. Again, the main limitation here is a lack of ability to examine long-term relationships, perform scenario analysis or control for short-term influences on long-term results.

While far from error-proof or perfection, the econometric method addresses essentially all of these key challenges, as discussed in the next section.

Integrated Econometric Models: Model Structure and Data Requirements

Functional Form

Econometric forecasting makes use of regression to establish historical relationships between waste generation or disposal and various explanatory variables based on fundamental economic theory and experience. The basic structure of such a model is as follows: $Waste = f(X\beta) + \epsilon$.

X equals a series of candidate explanatory variables that are believed to be theoretically linked to waste generation or disposal. Several models of this nature have been developed and have shown that some of the key drivers include economic well-being, prices, seasonal or annual variability, the existence or

persistence of various waste management programs and strategies, and waste flow control regulations at specific landfills, among other variables. Each system is unique, and a tailored econometric model can be used to tell “your story”.

β equals a series of econometrically estimated parameters (one for each candidate explanatory variable) that determine whether (i) the explanatory variable is a statistically significant driver of waste and (ii) if so, helps to quantify this impact by being retained in the final econometric equation used to forecast future waste, and ϵ equals model error, which must be uncorrelated to the explanatory variables and random.

In this approach, the significance of historical relationships is evaluated using commonly accepted statistical measures. Models that, in the view of the analyst, best explain the historical variation of waste disposal or generation are selected. The selected models are then populated with projections of explanatory variables, resulting in projections of waste generation or disposal.

Econometric forecasting can be a more reliable technique for long-term forecasting than trend-based approaches and other techniques described above, because the approach results in an explanation of variations in waste generation rather than simply an extrapolation of history. In addition, understanding the underlying relationships that affect solid waste markets allows solid waste industry organizations to perform scenario and risk analyses, thereby improving decisions.

Econometric modeling can be informed by a combination of objective (third party) projections of economic conditions, local information about facility capacity availability, other local conditions and nuances believed to have an impact, and externally derived benchmarks (such as EPA estimates). Econometrics also affords the analyst the ability to make various technical adjustments for short-term fluctuations using specialized statistical techniques that reduce model bias and prevent short-term perturbations from “masking” longer-term relationships. However, there are certain limitations that should be noted, particularly with respect to data quality and availability.

Data Requirements

With respect to data requirements, data is at the heart of the econometric method, and in order for such an approach to be successful above and beyond competing methods, a solid foundation of historical data must be available and/or should be a priority for communities and municipalities moving forward. While recycling data is more difficult to obtain, landfill data may be more readily available. Without good historical data on disposal in tandem with recycling, forecasting either concept econometrically may be challenging.

All of the other data requirements center on the universe of potential explanatory variables, a sampling of which were discussed in the previous section. Most communities have a good handle on rate structures, prevalence of recycling programs or initiatives through history, and can readily purchase third-party economic data for their county or metropolitan statistical area that captures long-term historical and projected economic conditions.

Consequently, the data “bottleneck” is really the quality and reliability of historical disposal or generation data, and the definition of the solid waste system (i.e., are we talking about a county, a borough, a single landfill, etc.).

Proof of Concept: Econometrics in Action

Model Overview—Where Did the Data Come From?

Data for this example was extracted from CalRecycle’s Disposal Reporting System. The Disposal Reporting System contains detailed data on a by-landfill basis for disposal as well as alternative daily cover. The data contained in the reports is based on information reported by permitted facility operators and

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Econometric Modeling of Waste: The Value Proposition in an Uncertain Economy

compiled by county and regional disposal reporting coordinators. CalRecycle staff is responsible for entering this data into a custom database, checking the data entry, and then releasing the data in yearly increments. Output is available both on a by-origin or by-destination basis.

Econometric Analysis

SAIC performed econometric analysis on these data points for each county in California in order to develop forecasts for the quantity of disposed waste originating in each county through 2025. This work was performed under a contract to CalRecycle to help develop CalRecycle's Facility Information Toolbox. These forecasts were based on economic and demographic data collected by SAIC, and assume, in essence, that current diversion rates in each county remain static at their 2009 levels. **Figure 3, page 25** shows an example county's econometric output for the base case.

Notice the perturbations in the most recent period (the ramp up during the build-up surrounding the housing bubble) in **Figure 3**. Linear or short-term trending would have suggested tonnages that were considerably higher than those experienced through the end of 2009. Furthermore, it is obvious that the intrinsic volatility in reported tonnages is very high, which makes econometric modeling the appropriate tool for capturing a combination of variables to explain such volatility in lieu of unit elastic approaches (which are obviously not borne out by the data in this example) or per-capita rules (which, if applicable, would suggest far more stability than is borne out by the data).

For each county, SAIC prepared an initial specification (or equation), which was then scrutinized for sensibility and quality several times. Once the equation for each county was finalized, independent projections of the explanatory variables that were retained in the equation (as described above, the results for each system will be unique) were used to extrapolate the historical relationships into the future and produce a base case forecast.

SAIC did not arbitrarily explain away anomalies with econometric adjustments in cases where the relationship between economic well-being and historical disposal were weaker than expected. Care was also taken to develop theoretically sound models. For example, a model that suggests a negative

relationship between economic well-being and waste disposal would have been rejected for use, irrespective of its performance with respect to diagnostic statistical measures.

The base case reflects the best estimate for initial planning. Relating this key issue to the note above about theories, economic well-being and waste disposal tonnage have been positively related historically. In the future, as waste reduction measures and emphasis on sustainability continues, such a relationship may actually reverse itself. Such market dynamics make it critical to develop uncertainty bands around the forecast and to allow the modeler freedom to make adjustments to the base case to reflect potential future scenarios. The next section discusses how this same modeling framework can be used to develop risk bands.

Dealing with Uncertainty—Risk Bands

SAIC developed high- and low-case results using the same econometric equations as were developed for the base case, but with simulations of high- and low-case values for the economic drivers. SAIC developed these high- and low-case values based on the historical margin of error in third-party economic providers' projections of these variables. The high and low cases represent the 90th and 10th percentiles of expected future disposal quantities, meaning that there is approximately a 10 percent likelihood that actual disposal tonnages will be above/below the high/low bounds. **Figure 4, page 26** extends the results of **Figure 3** by adding the high and low bounds developed by SAIC onto the same example results.

Conclusions

In summary, we can conclude the following:

- An emphasis should be placed on more rigorous, long-term planning approaches that carefully address a range of potential futures and allow for scenario planning in lieu of rules of thumb or simple trending techniques.
- The econometric framework is a superior method of projecting waste tonnages because it results in an explanation of historical variation rather than a myopic extrapolation of history.
- An econometric modeling structure affords stakeholders the ability to

produce high/low risk bands using the same equation developed for the base case that represents a specific range of uncertainty with respect to expected future outcomes.

- In order to achieve a successful modeling framework that has econometrics as the centerpiece, a premium must be placed on solid and trustworthy historical data and facility information. | **WA**

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Fast Forwarding Fabric

Ben Fox

Enhanced engineering and materials have HELPED TENSION FABRIC BUILDINGS EVOLVE RAPIDLY.

TWO OR THREE DECADES AGO IT WOULD HAVE BEEN

rare to see a fabric covered building anywhere, much less as a prominent fixture at a waste transfer station or sorting facility. But as the tension fabric industry has grown over the last 15 years, more and more industries are seeing the advantages of fabric structures—such as their non-corrosive properties and ability to allow natural light to permeate the building.

Whether used for equipment storage or a more active aspect of a waste handling operation, fabric buildings have become a dependable and cost-effective option when a structure is needed. Additionally, the quality of these buildings has come a long way in a relatively short time. Many new trends have worked their way into the design of tension fabric structures, whether they are gradual improvements to industry staples or dramatic new strides in engineering.

Going Rigid, Getting Flexible

By far the biggest recent change with fabric buildings is the rigid frame-engineering concept that was introduced to the market almost two years ago. This new design trend uses structural steel I-beams in place of the hollow-tube, open web-truss framing that

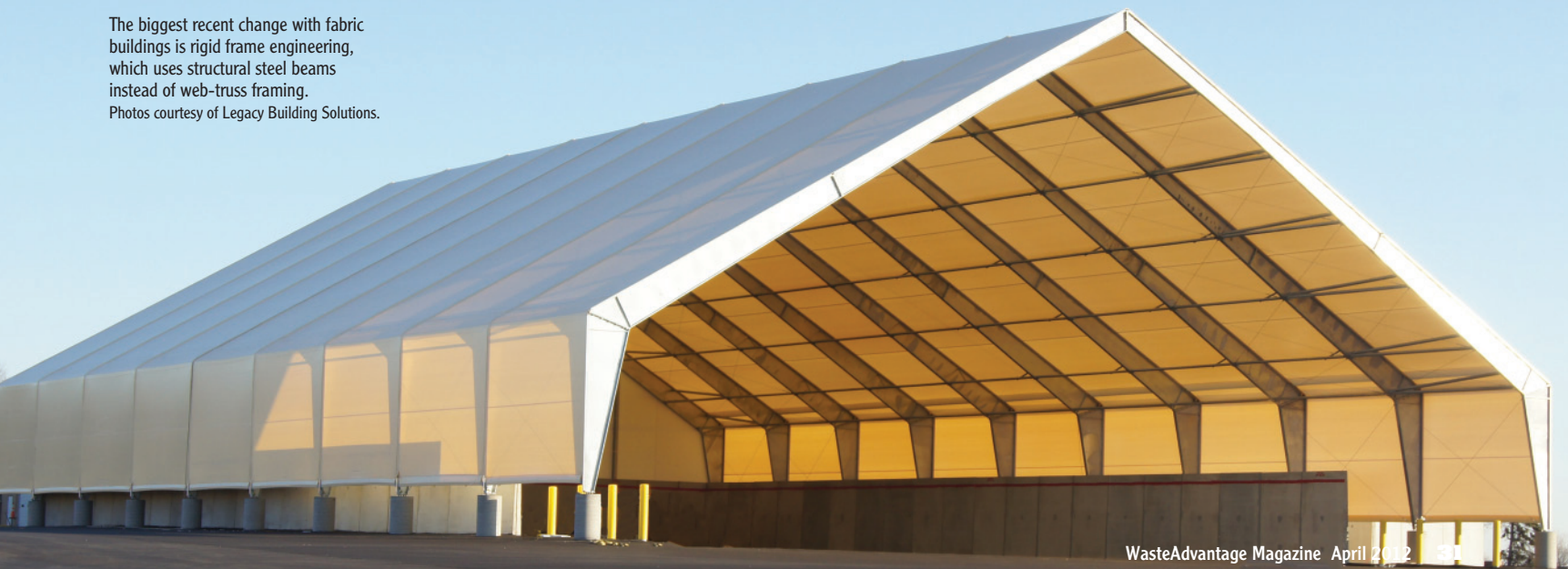
has traditionally been used for tension fabric buildings.

Why the change? Simply put, the I-beam design is almost universally accepted within the engineering community, whereas opinions on the quality of web truss design tend to be subjective. Certainly the industry couldn't have come as far as it has without the web truss being a serviceable option as the industry standard for so long, but the fact remains that there is usually very little consensus about what constitutes a well built or poorly built web truss building.

The more durable web truss buildings on the market typically feature thicker cords and webs, but the additional steel involved usually makes them more expensive than a similar building with a rigid frame. Cost aside, the rigid frame technique effectively eliminates any questions about the structural integrity of the building. And, for good measure, the I-beam buildings have a more conventional look and feel.

Another key advantage with a structural steel design is having the flexibility to customize buildings beyond the confines of standard sizes that are generally the norm with web truss. Custom sizes are possible with web truss designs also, but almost always at a much higher price tag and with longer delivery times. The process of rigid

The biggest recent change with fabric buildings is rigid frame engineering, which uses structural steel beams instead of web-truss framing.
Photos courtesy of Legacy Building Solutions.



Fast Forwarding Fabric



By providing straight sidewalls, clear spans and tall overhead clearances, I-beam design helps maximize the space within a building.

frame engineering allows end users to specify the exact width, length and height they require—without having to pay a premium and without waiting any longer for delivery. Offset peaks, multi-level legs and many other unique features are possible as well.

Waste industry professionals know all too well that maximizing space is a critical issue. I-beam design brings another engineering advantage in the form of straight sidewalls. Where the traditional web truss building shape is an arch that leads to some unusable space along the sidewalls, a rigid frame provides straight sidewalls, clear spans and tall overhead clearances that allow every square foot to be used. The straight sidewalls also make it easy to implement side doors of any shape and size.

Rigid frame buildings can also more easily accommodate other equipment and additional loads on the structure itself. Items like overhead cranes, conveyors and fire suppression systems can be hung on the frame. Commodity pressures can also be incorporated into the sidewalls. In a nutshell, the overall strength of a structural steel building makes a lot of things possible that couldn't be done in the past.

A clear benefit of all fabric buildings, in comparison to metal structures, is the non-corrosive nature of the fabric itself. However, with the hollow-tube web truss, unseen corrosion can actually originate inside a tube and do its damage from the inside out. Because they are solid, structural steel beams don't face the same vulnerability. Meanwhile, multiple coating options are available to protect the beams, including hot dip galvanizing, grey oxide primer and powder coat paint.

Putting It On

Going hand in hand with the I-beam design trend is the actual tensioning and application of fabric to a structure. Being able to apply fabric in straight lines on a rigid frame simplifies the process and prevents the type of chafing wear and tear that can occur when fabric is stretched over the curves of a web truss frame.

Often when fabric is stretched around a curve, the scrim is distorted and pulled at an angle that causes the fabric's coating to crack and eventually fail prematurely. In general, fabric should be fine if it's applied at the proper tension; however, even with experienced professionals handling the installation, fabric roofs are more likely to succeed in the long run with a simple, straight-line application. That being said, one critical detail with regard to almost all fabric

structures is to ensure that proper vertical and horizontal tension is applied during the installation of fabric panels.

Another factor is the size of the fabric being applied. For example, if a 200-foot-long building's roof is made up of only a few large pieces of fabric, it's going to be difficult to secure it at the proper tension. Consequently there's a very good chance that the roof will begin to move around once in use. By contrast, if manageable 20-foot panels are used, everyone involved can have greater confidence that they will be correctly placed and secured.

The method of installation is important as well. Having nails or screws penetrating the roof is to be avoided, as this can potentially create locations for rust to start and holes that can later become leaks. A better method is to support the panels with a track that keeps the fabric out of contact with the steel frame.

Fabric Options

Architectural fabrics also continue to advance in quality. For many years, polyvinyl chloride (PVC) coated fabric was the primary cladding choice for tension fabric buildings. But it was when polyethylene (PE) fabrics were introduced into the marketplace about 15 years ago that the frame-supported fabric structure industry began to blossom. With a life expectancy of about 10 years and a lower cost, PE fabrics fostered expansion into bulk storage and other building applications.

Over the last five years PE fabrics have greatly improved in quality. For properly installed fabric, it's usually sunlight and pollution that are responsible for material breakdown. By introducing thicker coatings and better UV inhibitors, PE fabrics are now expected to last as long as 20 years.

As fabric structure manufacturers have gained more confidence in the expected longevity of PE fabric cladding, there's more flexibility in making recommendations to customers trying to choose the best option between PVC and PE fabrics. With a life expectancy of 20 to 30 years, PVC coated fabrics remain the preferred option for high-end building applications.

Fabric roofs have many benefits. Inherently reflective, white roofs can reflect 80 percent or more of the sun's rays and emit at least 70 percent of the solar radiation that the building absorbs. Translucent fabric roofs can offer translucency as high as 12 percent, effectively eliminating the need for artificial lighting during daytime hours and making them an energy efficient solution.

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The strength of rigid frame buildings can more easily accommodate additional loads on the structure, and side doors of any size can be implemented.

Up and Running

Generally speaking, just about everything with a fabric building is simpler than it would be with a comparable metal building. Initial delivery times after an order is placed are shorter, and an experienced crew can install a fabric building in about one-third the time it takes to erect a metal structure.

Even when designed to be permanent, fabric structures are still inherently portable. So for operations that know they'll need to relocate a building after a certain period of use, fabric buildings are much more easily moved than metal buildings.

From design flexibility to cost-effectiveness, there are plenty of reasons why



An experienced crew can install a tension fabric building in about one-third the time it takes to erect a metal building.

the waste and recycling industry gravitates toward tension fabric buildings. Even better, the recent and rapid evolution of fabric structure engineering practically ensures that building owners can reap all the desired benefits that they expect, while knowing they're also getting a great value. | **WA**

***Ben Fox** is President of Legacy Building Solutions (South Haven, MN). Ben and his team at Legacy developed the concept of applying fabric to a rigid frame structure, making them the first fabric structure company to design and manufacture fabric covered rigid frame buildings. With more than 17 years in the industry, Ben and his company have installed more than 2,500 fabric structures covering 30 million square feet worldwide. For more information, call (320) 259-7126 or visit www.legacybuildingsolutions.com.*



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The Importance of Landfill Gas Energy In Integrated Municipal Solid Management In the Developing World

Brian Guzzone and Amy Alexander

Incorporating integrated solid waste management and landfill gas energy best practices can go a long way to protecting human health and the environment from the dangers of improperly managed and disposed waste. FINDING THE PROPER MIX OF PRACTICES TO MEET A LOCAL COMMUNITY'S MEANS AND NEEDS WILL HELP ENSURE A HEALTHIER POPULATION AND ENVIRONMENT.

AS THE WORLD'S POPULATION REACHED 7 BILLION

in 2011, the demand for access to improved sanitation steadily increased as a result of a burgeoning middle class in the developing world. Furthermore, by 2050, the world will include more than nine billion people.¹ Each year the world's population generates more than 2 billion tons of waste; if society continues to move toward the current waste generation patterns of the wealthiest cities in high-income countries today, then by 2025, we could be generating as much as 7 billion tons of waste each year.² Rapid population growth coupled with increasing prosperity in developing countries requires a serious examination of the waste management process (Figure 1) and the role of integrated solid waste management (ISWM) to safeguard the environment against air and water pollution and residual waste, protect public health and maximize the value-added elements (i.e., energy and recovered materials).

Waste Disposal

Currently, between 30 and 60 percent of solid waste from cities in developing countries remains uncollected and ends up on the street or disposed of

through open burning.³ This is a major public health and environmental concern affecting rich and poor alike, and poses enormous problems for growing cities and towns. However, due to rapid increases in population and urbanization, an increasing number of developing countries are beginning to use some form of landfill (i.e., uncontrolled or controlled dump, sanitary landfill) to manage increasing waste generation rates. Worldwide, the majority of waste is disposed of in landfills which alleviate several public health concerns, but creates additional environmental considerations. Landfills provide an anaerobic environment for wastes to decay that causes the release of landfill gas (LFG), odors and a host of other potential air, water and soil pollutants. The methane produced by landfills is of environmental significance because methane is a potent greenhouse gas and its ability to trap heat in the atmosphere, called its "global warming potential," is more than 20 times greater than that of carbon dioxide. Globally, landfills are the third largest anthropogenic source of methane, accounting for approximately 11 percent of estimated global methane emissions or nearly 799 million metric tons of carbon dioxide equivalent (MMT_{CO₂E})

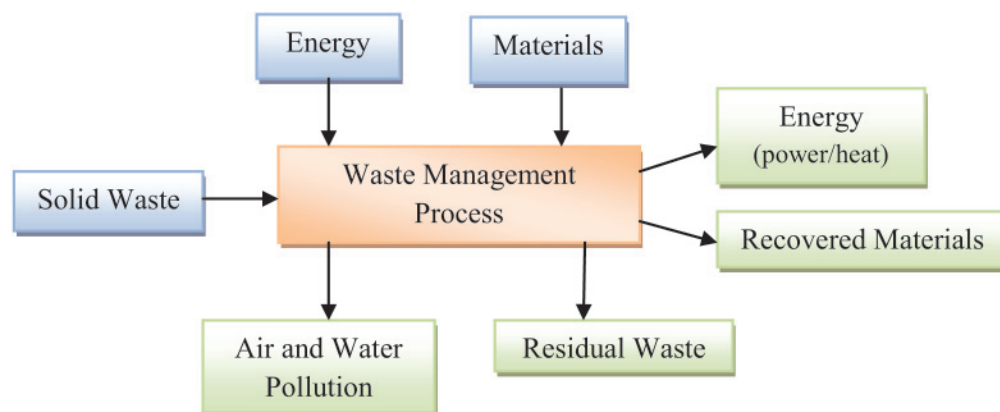
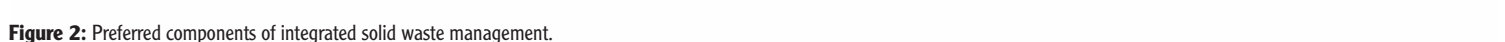


Figure 1: Lifecycle inputs and outputs of a waste management process. Figures provided courtesy of EPA's Landfill Methane Outreach Program (LMOP).



As developing countries transition to controlled or sanitary landfills, methane emissions will rise as more waste is managed in a proper manner which is conducive to LFG generation. Therefore, LFG collection and control measures are of increasing importance to offset these emissions. Moreover, the lowest-cost and often the most expedient solution is disposal of waste in uncontrolled landfills or dumpsites. Due to the relatively high cost of sanitary landfills, cities tend to make little progress toward landfill implementation unless the regulatory framework and environmental agencies apply enforcement pressure.⁵ Meanwhile, in many developed nations, the availability of landfill capacity has been flat or steadily decreasing due to regulatory, siting and environmental permitting constraints on new landfills and landfill expansions. As a result, new approaches to waste management are rapidly being written into public and institutional policies at local and national levels.

for assessing a company's claims and technological viability that has resulted in many systems that have been built, only to close shortly after costly startup, operations and maintenance. Therefore, helping local governments choose appropriate solid waste management strategies and technologies is critically important.

To address global waste management challenges, countries have focused on developing and implementing a variety of ISWM strategies to tackle the long-term management of waste. For the purposes of this article, the six major components of ISWM (**Figure 2**) are categorized as:

- ## Role of ISWM in Developing Sustainable Waste Management Practices



- Direct thermal
 - Boilers
 - Furnaces, dryers, kilns and process heaters
 - Infrared heaters
 - Leachate evaporation
- Electricity generation
 - Internal combustion engines
 - Gas turbines
 - Microturbines
 - Combined heat and power
- Conversion to high-Btu gas
 - Pipeline-quality gas
 - Compressed natural gas (CNG)
 - Liquefied natural gas (LNG)

should be based upon the needs and means of the local government as well as environmental regulations and national, regional and local policies. Each community must decide which waste management methods make sense for it based upon its unique environmental needs, economic situation and public policies. Additionally, no one process or technology can handle all of a community's waste, therefore a number of integrated methods for proper waste management should be considered. Initiatives from one country cannot always be exported to another and be expected to work as the local volume and composition of waste, infrastructure, economic resources, climate and cultural traditions and norms can vary significantly. For example, constructing a waste-to-energy plant in a developing country with high levels of wet organic waste such as food waste may cause operational challenges and increase costs because many WTE technologies are designed to burn wastes that are lower in wet food wastes and higher in readily combustible materials such as paper and plastics. In addition, economic considerations must be evaluated to determine the most appropriate solutions. For example, constructing a plasma gasification project in a small rural community (e.g., 25,000 inhabitants) may prove uneconomical due to the higher capital costs associated with the technology. The key to effective ISWM is the design and development of waste management systems that are best fit to local needs and challenges. Developing countries are beginning to recognize the need for a comprehensive approach to undertake sustainable waste management practices. For example, in Argentina, the federal government has embarked on a national ISWM strategy that includes

closure of uncontrolled dump sites in favor of regional modern sanitary landfills to serve populations from local communities and businesses.

Role of Landfill Gas in ISWM

Recovery of LFG is a critical component of ISWM. LFG recovery for flaring or energy is an effective method to reduce uncontrolled air emissions and improve public health and safety and the environment. With multiple environmental, social and economic benefits, LFG energy plays a critical role in municipal solid waste (MSW) management. LFG energy is a small but important component of an integrated approach to solid waste management given that the use of landfills continues to remain the predominant method of waste disposal in most countries. The U.S. Environmental Protection Agency waste hierarchy⁶ treats landfills and incineration equally, as environmentally acceptable disposal options for MSW. However, source reduction, recycling and composting are the more environmentally preferred waste management options. When these preferred methods of waste management are not employed and the use of landfills is the available option, energy recovery improves the greenhouse gas profile and makes use of the energy generated as the organic fraction of MSW decomposes. Where landfills exist, the use of methane generated by the decomposing waste already in place to produce energy is the best-case option to reduce greenhouse gas emissions and provide an alternative to fossil fuel-based power generation. Many landfills in developed countries already collect LFG and either use it to power engines for electricity generation, transmit it



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The Importance of Landfill Gas Energy In Integrated Municipal Solid Management In the Developing World

in a pipeline to a nearby end user to replace fossil fuel use (e.g., boiler, kiln, dryer), or flare it. Internationally, significant opportunities exist for expanding LFG energy (see **LFG Energy Recovery Technologies sidebar, page 36**). One such effective approach to reducing landfill methane emissions is the Global Methane Initiative (GMI), an international public-private partnership that brings together 40 governments and the private sector to develop projects that can reduce emissions from the agriculture, coal mine, landfill, oil and gas systems, and municipal wastewater sectors. Cumulative methane emission reductions achieved through GMI total more than 128 MMTCO₂E (for more information, visit www.globalmethane.org).

Incorporating ISWM and LFG energy best practices can go a long way to protecting human health and the environment from the dangers of improperly managed and disposed waste. Finding the proper mix of practices to meet a local community's means and needs will help ensure a healthier population and environment. | **WA**

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***Amy Alexander** is a Senior Environmental Engineer for ERG (Morrisville, NC). She has 15 years of technical experience in air quality, including evaluating landfill and LFG technologies and emissions, constructing emission estimation methodologies and inventories, evaluating and costing greenhouse gas mitigation technologies, designing software models, and reviewing and preparing air permits. Amy has provided technical assistance and outreach support to EPA's LMOP for more than seven years. She constructed and routinely enhanced LMOP's LFGcost model for conducting economic assessments of LFG energy projects. She assisted EPA's Office of Research & Development with the 2005 upgrade of the Landfill Gas Emissions Model (LandGEM) to make the tool more user-friendly and improve its LFG generation estimates. Amy can be reached at amy.alexander@erg.com.*

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Finding the Right On-Board Scales for Your Application

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ELECTRONIC ON-BOARD SCALES ARE NOT NEW. THEY

were introduced more than 30 years ago into trucking applications where monitoring gross vehicle or payload weight was necessary; however, platform scales were not readily available. Over the years, improvements were made to these early electronic on-board scales. Load cells were improved and specialty load cells were developed for fifth wheels, center hangers, single points and most other types of spring suspensions. Strain gage-based air sensors were added for an increasing number of air ride suspensions and suspension transducers for spring suspensions. Hydraulic sensors were designed for vehicles equipped with hydraulic lift cylinders. Today, on-board scales can be installed on any truck or trailer with air, spring or mixed suspensions.

The Benefits of On-Board Scales

Based on this product evolution, the applications for on-board scales are rapidly expanding and are found in every trucking industry. Currently, organizations using on-board scales realize benefits far beyond just

monitoring gross vehicle weight to avoid overweight fines. Given the high cost of time and equipment, on-board scales have a dramatic impact on the efficiency and profitability of operating a truck. On-board scales allow you to:

- Optimize residential and commercial vehicle efficiency by hauling the maximum legal payload on every trip to the landfill or transfer station without going to a platform scale
- Eliminate overweight fines
- Load transfer trailers to the maximum legal weight quickly at the loading point, without waiting in scale lines or driving to the nearest platform scale
- Eliminate travel to certified scales
- Reduce maintenance costs and increase vehicle life by hauling loads that the vehicle was designed to carry
- Increase safety by keeping weight within legal limits and allowing braking distance to remain constant and tracking around corners to be more predictable



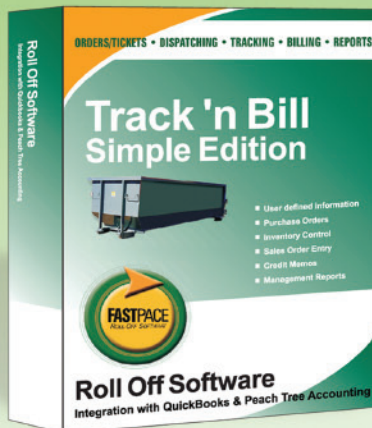
Front fork scale solution. Images courtesy of Vulcan On-Board Scales



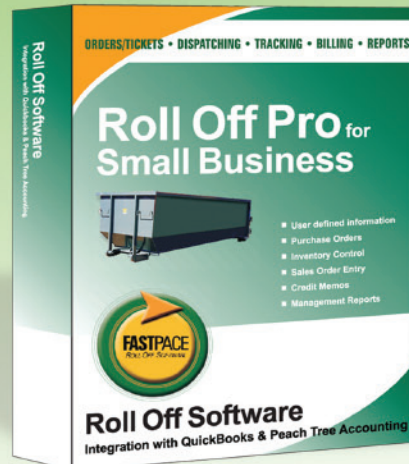
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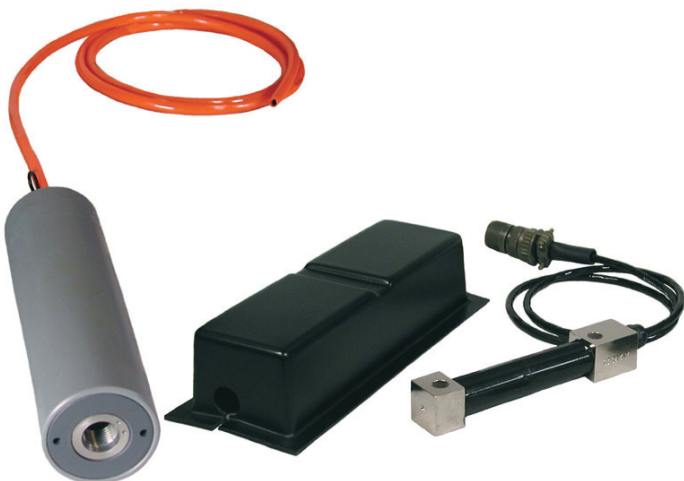
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- Improve customer service by providing individual pickup or container weight information to better ensure your commercial customers that they are being billed fairly
- Increase revenue by more accurately charging individual customers on heavy load pickup and delivery operations
- Increase driver retention by assuring a safe load, no exposure to overweight fines and reducing the amount of time it takes to get a correct load
- Improve operation efficiency by recording weights, load cycles, dump cycles and route/service times. With the increasing use of on-board computers, wireless communications and GPS equipment, weight information can be collected and transmitted real time back to the home office

When waste operations consider the previously mentioned benefits obtained from on-board scales, they typically calculate their payback to be from three to 12 months. This will become increasingly important in the future as the cost to haul without on-board scales increases due to the following industry trends¹:

- Increasing competition and the need to improve efficiency and reduce costs
- Increasing enforcement of overweight regulations
- Increasing need to reduce liability exposure
- Increasing difficulty finding and retaining competent drivers
- Increasing demand for more information
- Increasing use of on-board computers, wireless communications and GPS equipment

What Type of Scale System Should You Invest in?

That depends on your objective and which benefits you are trying to capitalize on. There is not a single solution that works for everybody. Choosing the right solution for the right application will allow you to realize your intended benefits while avoiding the long-term performance and maintenance headaches caused by selecting a system that is not suitable for your operation.

On-board scale systems available today include: body scales, front fork scales, roll-off scales, deflection transducers and air sensors. Body scales, front fork scales and shear pin load cells used in roll-off scales directly measure the load and are proven to be the most accurate over an extended period of time. Secondary measurement devices, including deflection transducers and air sensors, estimate weight based on a secondary measurement such as vehicle suspension deflection or air bag pressure. These devices are more susceptible



Transfer station solutions.

to outside influences and therefore require specific loading operation and maintenance practices.

Body Scales

Body scale load cells are a tried and true method for measuring the gross vehicle, net payload and individual pickup weights. They have been used for years on tipping and fixed refuse bodies. They require little maintenance and after calibration provide a high degree of accuracy without driver involvement.

Front Fork Scales

Front fork scales are also an accurate weighing solution that require some driver interaction to achieve the weights. Front fork scales work by weighing the individual bins on the route. Different options are available to achieve the weights: manual, where the driver pauses the bin midway twice during the dump cycle and records the bin loaded and the bin empty after dumping, or weigh-in-motion, where the weight is captured during the dump cycle without having to pause. Both methods require the driver to follow procedures to achieve the highest degree of accuracy. The system records individual pick up weights and total net payload weight. This application is ideal for route audits.

Roll-Off Scales

The roll-off and dump truck scales use a combination of shear pin load cells and a hydraulic sensor to weigh the load. These systems are extremely reliable and durable, providing accurate weights with little maintenance.

Deflection Transducers

Deflection transducers are a low cost option to load cells for measuring gross vehicle weight. They are mounted on the axles or suspensions of the vehicle and measure the deflection of the axle or suspension under load to achieve the weight. Under the right conditions and depending on application objectives they can provide a useful measurement, but are susceptible to outside influences including loading environment and driver performance. They also require more maintenance due to their mounting locations and a more systematic calibration schedule to maintain accuracy since they are approximating weight via a secondary measurement.

Transfer Station Solutions

Transfer vehicles use a variety of solutions depending on the suspension type. These include fifth wheel load cells and center hangers for spring suspensions on the tractor and trailer, air sensors for air suspensions or a combination of

both. These solutions allow the vehicles to maximize their load before they leave the pit. This saves the operation time lost on vehicles being overloaded or underloaded when crossing the platform scales requiring the vehicle to repeatedly return and reload.

Match the Best Solution to Your Needs

You've identified your goals and researched scales—now it is time to purchase your system or systems. Choose a scale company that offers a wide variety of on-board weighing solutions so that you are able to match the best scale solution to your specific goals and objectives. This way you can select a customized weighing program for your specific operation. The right scale system will help you maximize your loads, reduce costs associated with overloading, and help you realize the full potential of your vehicle and fleet to make a profit. | **WA**

Eric Elefson is the Director of Marketing and Sales for Vulcan On-Board Scales (Kent, WA). He has been involved in the on-board weighing industry for 13 years. Prior to that, he had 18 years in the industrial automation and control industry. Eric can be reached at (253) 872-1910 or via e-mail at erice@vulcanscales.com.

Note

1. Source material includes: increased and changing competition in the market, receiving locations, ie mills, etc. requiring more strict adherence, customer feedback and increased coverage of weight and on-board automation in industry publications.

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Rail Negotiating Best Practices

Darell Luther

Best practices in rail rate and service negotiations begin with PLANNING AND ANALYZING YOUR SITUATION, what it is and what it can be. Actual negotiations will flow logically if you are properly prepared.

Containerized waste truck to rail transfer yard.
Photo courtesy of Tealinc.

A TRANSPORTATION PROFESSIONALS' MANTRA IS

generally to obtain the highest quality and least cost transportation solutions for their company. In the waste and recycling industries there are a host of transportation requirements and corresponding solutions available. Picking the best combination of solutions can be a real challenge.

In this article we'll focus on providing guidance to those who find themselves in that middle ground moving municipal solid waste, scrap, construction and demolition debris, recycled goods and other general waste commodities from either a transfer station or fixed origin to a landfill, recycler or processing facility via rail.

Preplanning and Preparation

When it comes to rail transportation rate and service negotiations, preplanning should be your first course of business. Oftentimes we find the waste and recyclables gathering and disposal process and end use negotiations taking precedence with little regard to rail transportation price tradeoffs.

Rail negotiating best practices begin with the creation of a list of items that pertain to your situation and encompass taking a broad based point of view analyzing those items that can better position your company for more favorable rail rates and service.

To be effective in rail negotiations you first need

to understand your situation as it pertains to the rail situation and then attempt to understand the railroads situation as it pertains to your business. Always keep in mind that your end goal should result in the best rail rate and service package combination available.

Physical Facility and Rail Corridor Relationship

Rail negotiations preparation starts with a fairly straightforward analysis. This analysis is best conducted by asking yourself a series of questions that will disclose your company's current rail strengths, weaknesses and opportunities. A series of questions designed to lead you through the preplanning and preparation stages include the following:

- *Where are your origin facilities located, what are their physical rail related characteristics, do they interchange with one or a multitude of railroads and how does your facility(s) physically interchange with the railroad?* Facility location in this case is only relevant in its relationship to rail access. Whether you have one or a multitude of facilities, the value of having access to two or more rail carriers is often worth double digit percentage rail rate discounts when compared to single rail access points.
- *What should you do if you have one or a number of captive rail facilities?* In this case, you need to dig deeper and



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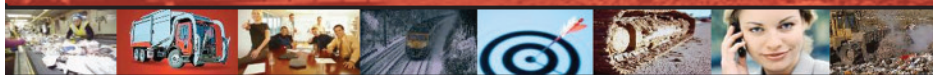


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Rail Negotiating Best Practices

understand the situation from the railroad's point of view. Is there an option to bundle facilities and drive more rail traffic to a rail carrier through a Rule 11 rate structure to interchanges that are more favorable to a select rail carrier? Is the existing rail traffic in the lanes you want to use at, under or over the current rail line capacity? Does the railroad want more traffic on a particular lane or not? How will your traffic effect the current rail operations for a particular rail line segment? The next logical step is determining the volume impact that your rail traffic will have on the rail line segment. How many railcars per day, week, etc. can you offer to the railroad? Is there an opportunity to bundle the volume thru one or more origin locations?

Volume in railroading is an interesting phenomenon. One would think that more overall volume is better for obtaining a better rail rate. Generally this is true, but in some rail corridors this isn't the case. Providing sufficient volume to fill out an existing train can result in better rail rates than providing a level of rail volume that causes the railroad to put on another train, resulting in a train that runs fewer rail cars than the train makeup and corridor its running can physically haul. Consider that a railroad dedicates sufficient crew and power to a specific traffic lane to theoretically transport the maximum trailing tons (i.e., number of loaded cars) that a configuration can pull over a given lane. Anything less are wasted resources and the customer usually ends up paying via rates for empty train space.

A good tool to help provide a general guideline to the railroad's cost and train capacity requirement for a particular lane is the use of the Uniform Rail Costing System (URCS). URCS is the Surface Transportation Board (STB) railroad general purpose costing system that estimates variable and total costs for Class I U.S. railroads. This information is updated annually. URCS will give you general variable railroad cost information, but should only be used for guidance.

Up until this point we've taken a rather macro viewpoint of a rail transportation situation. We've determined whether or not the loading or destination facility(s) is open to one or more rail carriers, we've studied rail line configuration at a high level to understand if there are Rule 11 pricing opportunities, we've reviewed specific origin or destination locations to determine how they physically interchange with the railroad, we've taken a look at overall volume and the breakdown of that specific volume on particular rail lines and we've obtained general railroad variable cost information for our intended rail lanes and volume offerings. We've also generated a host of questions that need to be answered before proceeding with any actual negotiations. How does one go about answering these questions?

Existing Pricing

Take a look at current pricing for your commodity. In many cases rail transported commodities will be governed

by publicly available tariff pricing for a particular Standard Transportation Commodity Code (STCC). These prices are generally available on Class I railroad Web sites. In many cases you'll need to sign up for the railroad's Web site. After you find your STCC, you'll want to take a look at all tariffs in place that govern your commodity. What you're looking to do is to obtain an understanding of differential pricing in specific corridors for the number of cars, junction routing to support Rule 11 or through route decisions and geographic differences to determine capacity in a particular corridor or geographic area (e.g., Northeast U.S. versus Southwest U.S.). You can then reconfigure this information to train size and rate per ton mile information that will give you comparative information to your situation.

You should also be sure to understand any accessorial charges, such as demurrage, use of railroad supplied or private equipment, private car storage, track space requirements, etc. that will impact your business. These are all key pricing points that will impact your ability to obtain favorable rail rates and service.

Service Requirements

Don't assume the service requirements you have in mind and the service that will be provided by the railroad will match up. If you expect to be negotiating rates and service for an existing facility, talk with your local serving railroad train operations personnel to best understand the service parameters the railroad will provide. They often can provide you with enough meaningful information so that you can understand the entire train handling process from origin to destination without engaging in negotiations. This approach also applies to any of your

receiving facilities as well. It's important to be armed with as much information as possible before entering into actual negotiations. If you are working with a Greenfield site or are acquiring a new facility (origin or destination) it's a good practice to ask your railroad sales representative to provide you with the railroad service planning department analysis as it pertains to your situation.

Putting it All Together

Adequate preparation for rail rate and service negotiations is very similar to putting together a complex jigsaw puzzle. Any missed piece and you're off course and backtracking to a point of stability.

Best practices in rail rate and service negotiations begin with planning and analyzing your situation, what it is and what it can be. The access to rail carriers and compilation of geographic area and train service density in a corridor, how your business fits in the model of the railroad, understanding rates and service for pre-existing like-type business in that corridor or other geographic locations, volume and service requirements from your perspective coupled with volume and service capabilities that the railroad can and will offer, impacts of accessorial charges and provision of service are all pieces of the puzzle that must be conjoined. Actual negotiations will flow logically if you are properly prepared. | **WA**

Darell Luthber is president of Forsyth, MT-based Tealinc Ltd., a rail transportation solutions and railcar leasing company. He can be reached at (406) 347-5237, via e-mail at darell@tealinc.com or visit www.tealinc.com.

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THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) has cited that 40 percent of employees injured at work have been on the job for less than a year. The cost impact recordable injuries can have on your company, including workers' compensation costs and higher premiums due to an increased experience modification factor, is significant. To limit your operation's potential exposure, hiring smart and being selective with new job candidates is imperative. The interview process can be costly, but not as much as a safety incident.

On average, the cost to recruit and hire a new employee can vary anywhere from \$1,500 to \$5,000. In hindsight, this may sound like a great deal of money for your company, but if you think hiring professionals is expensive, try hiring amateurs. The average indemnity claim costs \$21,300. It would take over \$425,000 in sales to make up the cost of just one claim if the company's profit margin is at 5 percent. Imagine that number coupled with the fact that 40 percent of injured employees have been on the job less than a year. The cost to recruit and hire a new employee doesn't seem so large anymore, further emphasizing the fact that every new hire is an opportunity to advance your company or wreak havoc on it. If you're going to spend the money to recruit and hire a candidate, discern whether they have the skillset and concern for safety necessary during the interview process to become a return on investment, rather than your next insurance claim.

Recruiting the Right Talent

How your company is organized around recruiting and hiring for the next job opening requires strategy, persistence and preparation. This responsibility should not be taken lightly, as each selection can greatly impact the positive direction desired for your organization. Recruiting the right talent is the next step you can make to improve operations and further promote workplace excellence and safety.

Strategy

The key to an effective hiring strategy is to have one. Most companies simply "wing it" when it comes to employee recruitment. Building a timeline with set goals for both the hiring and training process is a strategy to ensure the necessary transition time an employee and company needs for safe and profitable operations. Each position should have a detailed description of necessary skills, qualifications and abilities. Consult both supervisors and any past or present employees who hold that same position for a detailed analysis of the day-to-day functions and ways to succeed in that role. For example, if there is heavy lifting or driving requirements, these areas should be identified along with any comparable testing. It is better to screen out unqualified candidates than to put employees and your company at risk.

Persistence

Keep focused on what characteristics you believe are the essential qualities that a candidate must possess in order to become an employee at your company.

Don't waiver or compromise on an individual if he or she is not meeting the exact criteria set for the position. Think of employees as an investment. It is cheaper to recruit, hire and keep the right individual than to have frequent turnover in a set position. Persistence in hiring the right candidate will yield a more favorable long-term result, in which the individual, company and workforce have lower incident rates and higher morale.

Preparation

Preparation is a key stage within the selection process. You not only want to be prepared to evaluate your next new employee, but also showcase the strengths, expectations and examples of what it takes to become a member of your team—one that prides itself on operational efficiency and a Zero Accident Culture. Being prepared means:

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—Jim Collins,
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- Researching and studying job applicants before your meeting
- Formulating open-ended questions on the importance of minimizing risk and promoting a safe working environment
- Having a strong closing that reiterates employee and company responsibility

You Never Get a Second Chance to Make a First Impression

During the interview process, gauge the candidates understanding of common industry exposures and their personal philosophy towards safe practices. At the same time, set forth the company's expectations and determine whether your goals are aligned with theirs. Here is an example of a behavioral interview question centered on safety:

- What was your best experience on the safety committee at your previous job(s)?

Rationale: They either were on the committee or not. If the candidate was on a committee and explained something that made an organizational and financial impact on the organization, you are on the right path.

If they were not on a safety committee, here's an additional way to spin the question:

- What contribution/s did you provide for a past safety committee representative?

Rationale: If the response is that they never did or thought to do so, you can state that at ABC Company, we expect everyone to be involved with our safety committee or initiatives in some form or another. If selected to be on the committee, you will be responsible for representing and upholding all safety initiatives in the company, as well as leading, coaching and mentoring others. If you are not on the committee, we expect you to add value by providing pertinent feedback as to where we can improve safety in your specific area, or where you might see a weakness in other areas of the organization.

You're Hired!

I know this may be easier said than done, but the numbers really do speak for themselves. The cost of a claim or incident both financially and morally can be nearly triple the cost of hiring. Remember that strategy, persistence and preparation in the hiring process can pay dividends. It is essential to ask the tough, important questions during the interview phase to evaluate whether a person is the right fit for the company and the strong expectations you have towards promoting a Zero Accident Culture. | **WA**

John Wayhart 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 industry. In the 1989, John trademarked the Zero Accident Culture® and continues to teach, coach and mentor this process to help drive down the cost of risk to improve operational effectiveness and financial results. He can be reached at (847) 463-7161 or jwayhart@assuranceagency.com. See Assurance Agency at the Waste Expo, booth #19006.

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Larry Stone Honored with Inaugural Safety in Motion Award

The Waste Industry's first SAFETY IN MOTION AWARD IS PRESENTED TO RUMPKE'S DIRECTOR of Corporate Safety.

LARRY STONE, RUMPKE DIRECTOR OF CORPORATE

Safety, was presented with the inaugural Safety in Motion award in a surprise ceremony at the Rumpke corporate offices in Cincinnati, OH on March 1, 2012. The Safety in Motion Award was created by Preco Electronics as a way of recognizing the safety individuals who keep safety moving forward through initiative, involvement and imagination within their company, community and industry. The Safety in Motion Award will honor one person each year who is the voice of safety in their industry. The key characteristics when choosing the winner are initiative, imagination and involvement. Every year Preco will invite others in the industry to nominate candidates for consideration.

Choosing a winner in an industry with so many professionals that dedicate their lives to safety was no

easy task, especially since the inaugural award winner was selected from unofficial nominees. "We actively went out to trade shows, WASTEC/NSWMA meetings, and spoke with the safety people in the industry to determine who should be considered for the first award," according to Teresa Prisbrey, Marketing Director at Preco Electronics, "Larry Stone's name kept coming up as an expert."

"In choosing the inaugural winner of this award, we looked for an individual whose entire career encompassed a dedication to safety. This made Larry the obvious choice for the Preco selection team," stated Dave Anderson, National Sales Manager at Preco Electronics.

An Active Safety Proponent

All one needs to do is look at Stone's resume to see his commitment to safety. Before becoming an active safety proponent in the waste and recycling industry, Stone worked as both a police officer and fire fighter EMT. These two noble professions are dedicated to the safety of the communities they serve. He is still an active fire fighter today at the Hanover Township Fire Department. Just in the past few years, he has encompassed all the areas of safety this award was meant to honor: initiative, involvement and imagination.

Stone takes initiative. When he sees a problem, he creates solutions. For example, he has a commitment to developing and promoting a program to reduce accidents involving drivers struck by passenger vehicles. These incidents are on the rise—industry reports say it is second only to reversing accidents as the most common accident in the Waste Industry. Stone has taken it upon himself to approach manufacturing companies to discuss the issue, assist with determining key product functions and provide the valuable testing when available.

Additionally, as Rumpke's safety director, Stone created the *Slow Down to Get Around* campaign to encourage motorists to slow down and use caution when navigating around service vehicles in roadways. This program was created after two company employees were struck by cars within a single week. This campaign has since been embraced by WASTEC and SWANA,



Larry Stone (left) and Dave Anderson, Preco Electronics' National Sales Manager.
Photo courtesy of Laura Anderson.



2013 Safety in MOTION AWARD

Nominations for the 2013 Safety in Motion award will be accepted beginning in

November 2012. An official call for nominations will be sent out via e-mails to key contacts in the Waste Industry. To ensure your e-mail is included in this notification, please contact Teresa Prisbrey at tprisbrey@preco.com with your contact information for inclusion in the e-mail notification. The award criteria include the following characteristics:

- **Initiative:** The ideal candidate will initiate candid discussions, programs (corporate, community or industry) and/or give voice to safety issues in the industry or community.
- **Imagination:** The ideal candidate will demonstrate creative and original suggestions to move safety into the forefront of the community, legislature, company or industry they serve.
- **Involvement:** The ideal candidate will take an active role in industry associations, community safety programs and/or corporate/legislative policy changes to advance safety.

with brochures, a Web site, advertisements and other activities to extend the reach of this crucial community outreach message. The National Institute for Occupational Health (NIOSH) included a draft of the *Slow Down to Get Around* program in their evaluation of struck-by accidents.

The imagination Stone brings to solving safety issues is evident in the *Students Against Crashes* (SAC) program he created in 2004 when two students were killed in an automotive accident. The program is dedicated to helping students reduce accidents by teaching safe driving skills and giving seminars on the importance of safe choices, especially during prom nights, when accidents for students are more prominent.

Stone's involvement in the Waste Industry and community is well known. He is an active member of WASTEC and NSWMA, serving on ANSI committees, attending safety meetings and providing valuable input to future safety regulations. It isn't surprising to see Stone quoted in many industry publications, as journalists often seek him out to provide an expert opinion for their safety articles. There are many other accomplishments Stone has achieved in his quest to move safety forward. He continues to set an exceptional example for safety professionals through his involvement and dedication to his field.

Upon receiving the award surrounded by coworkers, Stone was clearly touched. "To be recognized in this peer group, with so many great people, is humbling," declared Stone as he received his award. Co-workers at Rumpke were not surprised to learn Stone received the inaugural award. "Larry has always focused much of his time, energy and creativity on delivering safety messages to the industry and the public. His efforts have earned him a well-deserved, distinguished place among safety professionals," said Bill Rumpke Jr. chief operating officer at Rumpke Consolidated Companies, Inc. "Rumpke will always be a proud supporter of efforts to reduce injuries and accidents and ensure the safety of our team and the communities we service."

Peter Evans, Vice President of Sales and Marketing at Preco, stated "We are excited about this award, and look forward to recognizing the many professionals who dedicate their time to keeping people safe."

For more information, contact Teresa Prisbrey at (208) 323-7114 or e-mail tprisbrey@preco.com.

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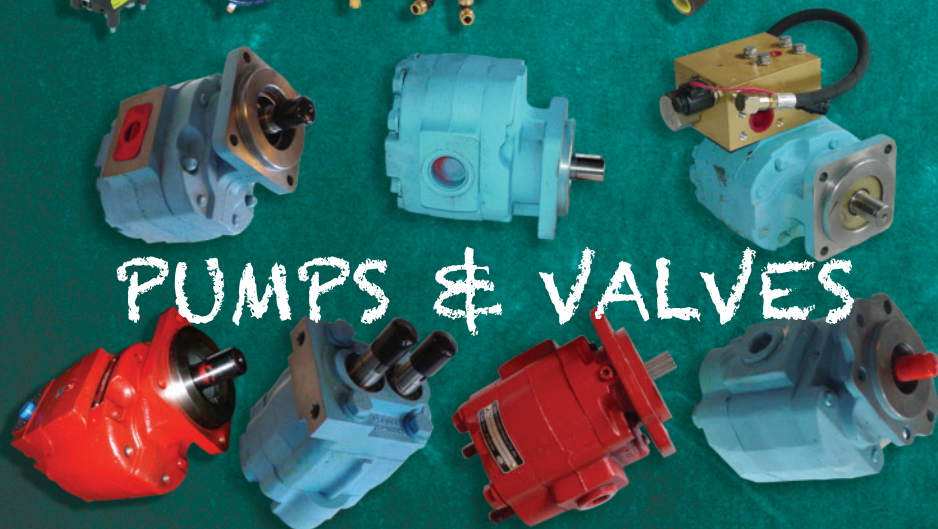
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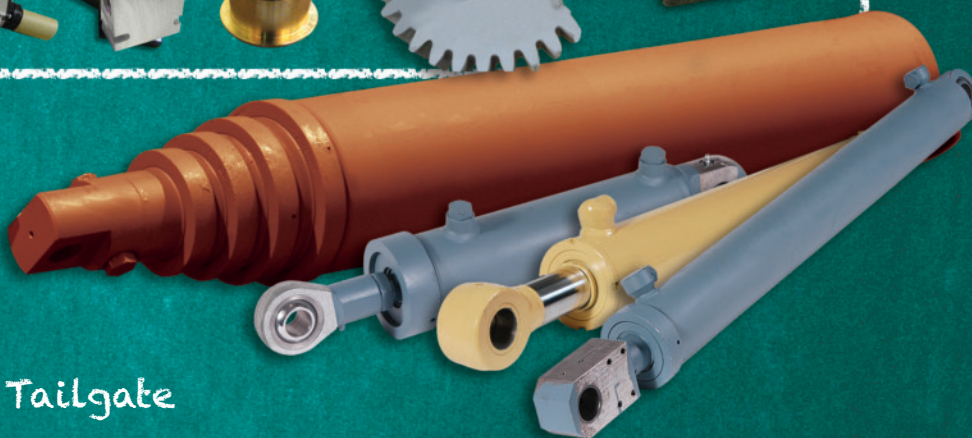
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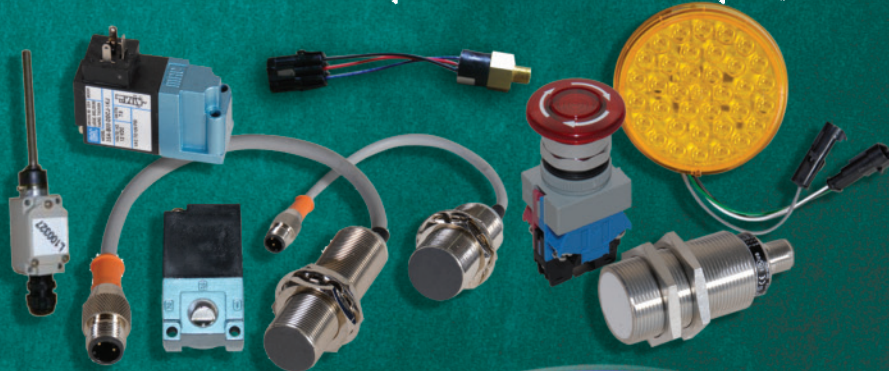
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Breakthroughs and Innovations



BENLEE's (Romulus, MI) newest product, the Super Max LT Gondola trailer, combines size and durability with a lightweight design that maximizes payload. Made with 3/16" Hardox steel floors and 1/8" Hardox steel sides, the Super Max LT is a heavy-duty trailer without being too heavy. Available options include 1/4" Hardox floor, 12" floor channel spacing, side reinforcements and 1/4" top tube.

BENLEE's Super Mini in most cases is a "Roll-off Truck Replacement" because the Super Mini Trailer vs. a Straight Truck is:

- Similar in Length—carries the exact same 20/30/40 (or Tall 50) yd box
- More maneuverable—gets into tighter spots
- Payloads more—Federal/State laws
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Importantly, this unit has all the same major components/upgrades of BENLEE's "Conventional" 40' tri axle units, such as ArvinMeritor 25,000 lb. axles, Parker-1" Tough Cover 3000psi Hoses, Chromium Trivalent plated 1" steel lines, etc. It is an incredibly versatile trailer. Because this unit has

become their best selling product, they are stocked for immediate shipment, with and without tarp systems.

FOR MORE INFORMATION, CALL (734) 722-8100 OR VISIT WWW.BENLEE.COM.



MINIMIZER (Blooming Prairie, MN) manufactures poly truck fenders, poly toolboxes, custom mud flaps and truck accessories. Minimizer uses durable materials and proprietary processes to build long lasting products that are tough enough to please people in a tough industry. Use Minimizer's innovative fenders and mud flaps to make your truck stand out from the rest.

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The **KLEENOIL** (Plano, TX) Onboard Oil Recycling System is a bypass oil filtration system that passes only a small portion of the total oil flow through a very dense filter cartridge at about 2 to 3 quarts per minute. At this speed, it is possible to remove particles down to 1 micron (3 absolute), remove 99.95 percent of all water, greatly decrease engine wear and prolonging oil life. Kleenoil can eliminate water and particle contamination, extend oil life up to five times and hydraulic oil up to 10 times, reduce engine wear and component wear, dramatically reduce downtime, remove particles down to 1 micron (3 absolute) and is applicable to engines as well as hydraulic systems.

The filtration unit is made of cast aluminum with a galvanized steel mounting bracket. It is connected to the engine lubricating oil circulating system in a bypass loop using high pressure braided hose and fittings to SAE standards.

FOR MORE INFORMATION, CALL (972) 633-2226 OR VISIT WWW.KLEENOILUSA.COM.



LAWING & LAWING LLC (Maiden, NC) has developed a product they hope will solve a growing problem in the waste industry. As more areas adopt a once a week garbage pickup schedule using 95 gallon or larger trash carts many customers are complaining about not being able to balance and control the large carts. That's a problem that the Lawing team hopes to alleviate. Lawing and Lawing has invented the Trash Cart Caddy, a product that attaches to the cart at the axle and the handle and when the cart is tilted back into the travel position, the load is distributed between the existing wheels of the cart and the two added wheels of the "Caddy" and balanced without any help from the person who will be pushing it. The Caddy's 14 gauge steel construction makes it lightweight but gives it plenty of strength to handle the heaviest trash cart. It's rubber tires and hand brake give it plenty of gripping power to control the speed down the steepest driveway. And it's Made in the USA. The Trash Cart Caddy will greatly reduce if not eliminate the problems the older and/or physically limited residents are having with the large carts.

FOR MORE INFORMATION, CALL (704) 740-6479 OR VISIT WWW.TRASHCARTCADDY.COM.



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Waste Advantage Magazine's Recycling/Transfer Stations/Landfills (R/T/L) section has become a very important part of our readership. Our timely, relevant editorial in this section—products/services releases, statistics, short tips, etc.—provides you, our R/T/L professionals, with the useful information that you need when making that important purchasing decision.

By making this important move, *Waste Advantage Magazine*, provides something for everyone in the waste and recycling industry and makes it the most complete one-stop-shop publication available today. We look forward to expanding our coverage of this segment of the industry and hearing your feedback.

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Recycling

An Opportunity for Haulers to be Heroes

Mitch Hedlund

“Having this standardized labeling system across North America will eliminate confusion and improve our recycling rates across film and TV production operations. Recycle Across America™ is offering wonderful, workable solutions.”

— Shannon Schaefer-Bart,
Sustainable Manager of
NBC/Universal Studios

EACH TIME I VISIT WITH SUSTAINABILITY DIRECTORS

and green team leaders of corporations, small businesses, non-profit organizations and schools, I ask these simple questions about their recycling efforts:

- How is your recycling program going?
- What percentage of your overall sustainability responsibilities does recycling and waste represent?
- How much time do you spend working on your recycling program?

Without exception, they tell me that the recycling in their buildings isn't going nearly as well as they believe it should. They explain that their employees, customers or students aren't using the bins properly and therefore, there are high percentages of trash in the recycling bins and recyclables in the trash bins. They go on to say that more than 65 percent of their time is spent trying to

improve or fix their recycling program even though recycling and waste only represents 8 to 10 percent of their overall sustainability responsibilities. And they remind me that they have struggled to know how to properly label their recycling bins.

Since the inception of recycling, most often an employee within an organization has had to try to figure out how to label the bins throughout their building. As a result, there are now millions of inconsistent and often ineffective labels on recycling bins throughout society, causing tremendous confusion for the public approaching the bin as well as apathy and even skepticism toward recycling.

It isn't just the public that's confused; cleaning crews have to contend with different looking recycling labels on bins in every tenant space, on every floor, in every



A standardized label for nearly every sorting need has been created. Photo courtesy of Recycle Across America™.



Mark Ruffalo, Rosario Dawson, Spike Lee, and Florence and the Machine have agreed to donate their time to promote the use of the national standardized labels. Photos courtesy of the Hollywood Reporter, Getty Images, Wireimage and Amazon.

building. And if the cleaning crew doesn't read English, the labels are even more confusing. This often results in recycling bins being emptied into trash carts.

Ultimately, capture rates are low, costly contamination is high and environmental and economic progress is hindered; in fact, the most recent EPA data relating to U.S. recycling rates (November 2011), reiterates this lack of progress. Despite the fact that recycling is the most recognized environmental action by the public, and despite millions of dollars spent on recycling competitions and awareness campaigns, capture rates in the U.S. remain low and have been nearly unchanged for 15 yrs.

“The Marsden culture is comprised of a cleaning staff that speaks over 78 languages. With the national standardized labels, we now have a clear and consistent labeling tool to train our staff and communicate the recycling needs of our clients.”

—Chris Norgren, Central Division President of Marsden Holdings, LLC

Familiar with the old antic “The definition of insanity is doing the same thing over and over again and expecting different results,” it's clear that more competitions, more awareness campaigns and more symposiums aren't the answer. It's time to view recycling from a practical

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lens to see what can be done to: 1) begin resolving the frustration sustainability directors are experiencing, 2) make the experience at the bin more consistent and instantly comprehensive for the general public, and 3) help improve the economics for recyclers, processors and next-life manufacturers.

The Solution is Easy

In 2009, I was the keynote speaker at a SWANA conference and proposed the idea of national standardized labels to help resolve the issue of confusion at the bin on behalf of the general public and to remove the burden on school, business and non-profit employees that are trying to 'figure out' how to label their bins. The response was very favorable and, as a result, a group of approximately 40 professionals were gathered from the recycling, compost, e-cycle, next-life manufacturing industries, as well as Fortune 500 businesses, consumers, students, parents, school authorities and government agencies to provide input and feedback on the standardized elements (colors, terminology, images and layout) for the labels.

In 2010, the non-profit organization Recycle Across America™ was launched along with its Web site (www.recycleacrossamerica.org) to introduce the society-wide standardized labels for recycling bins. Since the launch of Recycle Across America and without any solicitation or publicity, notable organizations have discovered the standardized labels, and have begun using and promoting them. Organizations such as NBCUniversal, Hallmark, AOL, Disney Motion Pictures, Johns Hopkins University, Macy's, Procter & Gamble, SC Johnson, Arlington County (VA), University of Maryland and SanDisk, to name a few. Even Canadian organizations

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such as University of Alberta and communities such as the Town of Banff have begun using the standardized labels.

Additionally, companies have begun donating money to help pay for free standardized labels to be used in public schools. For instance, in honor of 2012 Earth Day, Kiehl's (a L'Oreal owned company) has donated \$100,000 to Recycle Across America to provide 150,000 free standardized labels to 1,000 public K-12 schools and they have engaged four socially-responsible celebrities who have agreed to donate their time to promote the use of the national standardized labels.

This initiative will be featured in media venues such as: People, InTouch, W Magazine, Oprah Magazine, Shape, NYT, US Today, US Weekly, Prevention, Latina, Allure, Ladies Home Journal, Marie Claire, People StyleWatch, Redbook, Siempre Mujer, Real Simple, Fast Company, Yahoo News and others between the months of April and August. TV, online, radio and throughout Kiehl's in-store communications as well.

When a school district that has 15 buildings switched to consistent labels throughout all of their buildings, it resulted in capture rate increases of 47 percent with significant decreases in contamination. One can imagine what can happen to recycling rates when students and the general public begin seeing a consistent labeling system throughout society. The introduction of national standardized labels provides a terrific platform for ongoing national recycling communication campaigns; Kiehl's Earth Day and celebrity campaign being the first.

Haulers Can Be the Heroes

Haulers have a tremendous opportunity to be heroes in this movement by taking the burden of trying to figure out how to label their bins off the shoulders of their accounts. Haulers can do this by simply making their accounts aware that there are national standardized labels available (there's a standardized label to suit each hauler's sorting requirements), or by giving or selling the standardized labels to their accounts. Haulers can visit www.RecycleAcrossAmerica.org to order the labels with or without their brand added. Through license agreements, arrangements can be made for the haulers to use their own printers. The cost of the standardized labels are often at a minimum in line with or, in many cases, two to six times less than a black and white text only label. Proceeds from label sales help fund free labels for K-12 public schools and additional environmental initiatives.

In the end, the haulers, processors and manufacturers will have a higher quality and more marketable product with less cost in processing and they will have provided a valuable customer service to their accounts.

Coming Soon: A Subsequent Solution

A subsequent non-profit solution is currently in development to help increase the demand, the predictability and the profitability of the recycled commodities market. This solution is called A Buy Recycled Alliance™. "ABRA-cadabra ... look what your recycling has become!" ABRA is a Web site and phone application that allows consumers to click on the image of a standardized label for a recyclable material to identify the new product or packaging that recyclable becomes in it's next life, and it informs consumers which mainstream companies and brands are using the recyclable materials in their manufacturing. We will be releasing the beta version of ABRA-cadabra in the near future, so stay tuned. | **WA**

For more information about the society-wide standardized label initiative or ARBA, e-mail info@recycleacrossamerica.org.

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Paul Dow

THERE ARE THOUSANDS OF CLOSED LANDFILLS IN THE U.S. TODAY, AND

many of them are currently being used for their landfill gas, recreational or community-development potential. Although large or recently closed landfills can be appealing for their surface area and greater landfill gas generation, it can be easy to overlook the benefits smaller closed landfills can provide. In many cases, a small closed landfill can be transformed into a wonderful community asset.

This can be particularly true when considering harvesting landfill gas from small closed landfills. Small landfills (5 to 10 acres) or landfills that have been closed for a number of years are often assumed to have very limited landfill gas potential. However, a small amount of gas can be just enough of a seed to sprout a community center that can continue to thrive years after the landfill gas output has declined. When the right initiative is implemented correctly, it may be surprising what can be accomplished with a small amount of resources.

Packed house viewing the cattle auction at the WNC Regional Livestock Center. It is common for community members to outnumber the livestock producers in the stands. Photos courtesy of Altamont Environmental.

When a diverse combination of community partners unite around common causes, it can surprise even the most skeptical for what is possible.

Altamont Environmental, Inc., based in Asheville, NC, has provided technical expertise and proved to be a vital partner in turning ideas into reality on a number of successful landfill reuse projects. This article highlights two small-scale landfill reuse case studies and the commonalities that made them work. The first is a 12-year-old landfill-gas-to-energy project that supports a horticulture and artisan community. The second is a regional livestock center built on a closed industrial landfill. Following are the common keys to implementing these successful reuse projects.

Diverse Group of Partners

Successful reuse of a closed landfill requires expertise and effectiveness by a diverse group of community leaders, investors, volunteers, technicians and



engineers, state and local agencies, and politicians. Regardless of landfill size, the project is likely to fail if it is not supported by the community, local government and regulators.

Environmental Effects And Risk Abatement

Exposure to waste, leachate and landfill gas is a concern when reusing a landfill, and the means and methods used for past landfill closure are not acceptable today. Small landfills may be more likely neglected than large landfills in the years following closure. Therefore, determining the best type of reuse must include assessing the adequacy of existing cover and abating the potential exposure routes. Proper environmental assessments and engineering controls are vital to post-closure reuse.

It is usually preferable to construct buildings outside of the edge of waste. Covered waste areas are commonly better suited for activities such as parking or landfill gas extraction. Proposed reuse ideas that have the potential to compromise landfill cover should be rejected.

Compliance with State And Local Regulations

State and local authorities are charged with issuing the required permits in compliance with established

regulations. Engaging with regulators early and often can prove worthwhile. The regulatory climate has moved toward accepting landfill reuse that provides both a safe and effective means of promoting ongoing maintenance of the landfill cover. A landfill that is reused will be monitored and maintained much better than a landfill that simply gets mowed twice a year. Regular use and maintenance of landfills results in improved access and establishment of vegetation, both common violations issued to closed landfill owners throughout the country.

Case #1: EnergyXchange

In 1973, Yancey and Mitchell, two adjoining Western North Carolina Counties, cooperated in opening a 7-acre municipal landfill. The landfill was closed in 1994 with approximately 385,000 tons of waste. Like many closed rural mountain landfills, the site now provides a gorgeous scenic view of the Black Mountains, where visitors can see for miles.

Today the site, which is called EnergyXchange, includes a glass studio, clay studio, four greenhouses and an art gallery that use landfill gas from 10 extraction wells. Landfill gas from the nearby landfill provides fuel for the glass and pottery kilns, heating for greenhouses, and hydronic heating for galleries and offices.



View of WNC Regional Livestock Center with the closed industrial landfill in the background.



View of WNC Regional Livestock Center from Interstate 40 with the closed industrial landfill to the right.

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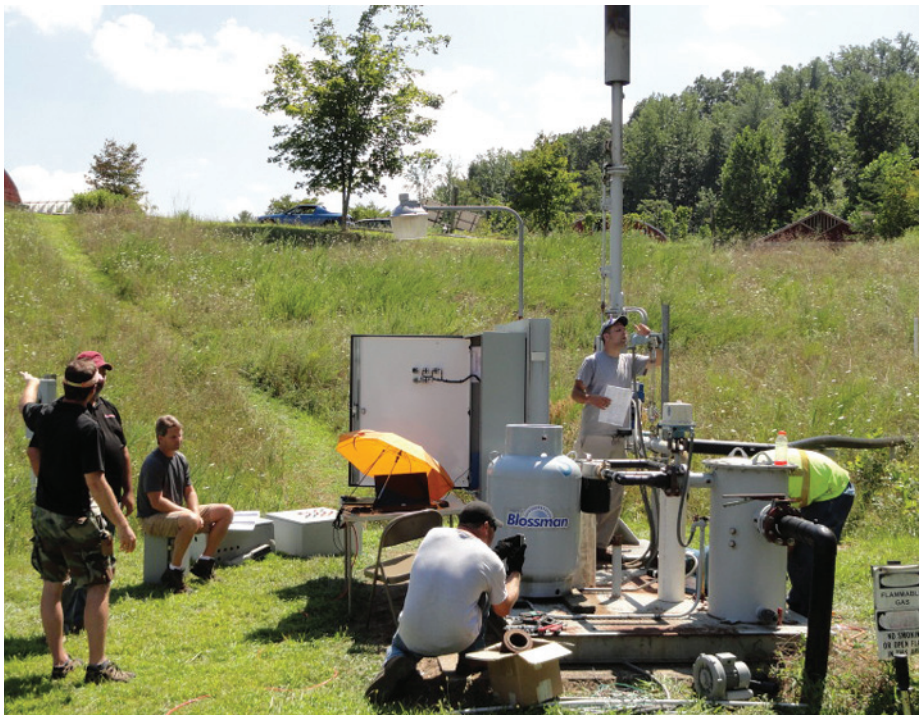
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Key partnership organizations responsible for the creation of the EnergyXchange include Blue Ridge Resource Conservation and Development Council (BRRCD), HandMade in America (HandMade) and Mayland Community College (MCC). These organizations began community meetings and interviews in 1996 to determine the best use of the landfill's resource. Among other efforts, they contacted the EPA's Landfill Methane Outreach Program (LMOP). The LMOP program conducted a feasibility study of the landfill gas potential and determined that the landfill gas was commercially viable. Commissioners from the two Counties that once shared the landfill, banded together again to support a shared initiative to use landfill gas to help fuel an artisan and horticulture center. Altogether, \$1.5M was raised to fund the EnergyXchange.

Jim McElduff, P.E., a founding member of Altamont, donated his time and technical guidance from 2000 through the initial years of operation. Altamont has been the environmental consultant to the EnergyXchange since 2005. For the recent upgrade projects, Altamont managed grant administration and obtained permits for treatment processing and for a new wood waste boiler and kiln.

Residents include two glass and four clay artists who pay rent to use the facilities. EnergyXchange gives the artists a place to both hone their craft and develop



Upgrades to the existing landfill gas flare being conducted at the EnergyXchange in 2011.

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View of closed landfill and Black Mountains in the background at the EnergyXchange.

their businesses. The residencies are highly sought-after positions because the landfill gas supplements a good deal of the fuel costs for these artists. The horticulture aspect of EnergyXchange, known as the Project Branch Out, is designed to nurture a market for native and endangered plants. Seeds are collected locally, and the landfill gas is used to heat greenhouses that grow several varieties of evergreen rhododendrons and deciduous azaleas. Plants are sold in to local growers.

The EnergyXchange has been so successful that the campus has been looking beyond the landfill gas resource. The output of the gas collection system was initiated in 1999 and currently averages approximately 40 standard cubic feet per minute (scfm). The projected output of the system in 2030 is anticipated to be approximately 15 scfm. Recently, the Department of Energy provided a grant to improve the gas collection system, implement the use of wood waste and solar energy, and improve the efficiency of the campus ensuring that the EnergyXchange will have a future as a local resource for job skills, community involvement and education.

Case #2: Western North Carolina Regional Livestock Market

Western North Carolina is home to approximately 3,000 livestock producers, who prior to March 2011 did not have a

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reliable sales and auction facility in the region. Like the EnergyXchange, a diverse group of stakeholders was formed, consisting of livestock producers, non-profit organizations, government agencies and local businesses, to conduct a feasibility study for the center. The preferred site was a closed industrial landfill, formerly operated by Champion International Corporation, that had accepted paper and pulp waste, fly-ash and wastewater treatment sludge. The site is highly visible and has a large flat area, which are both valuable commodities in the mountains area. The property contains two distinct landfill areas, one of which was already being used for an athletic facility.

Altamont conducted site investigations to determine the groundwater and surface water quality, landfill gas migration, site integrity, utility location, subsurface geophysical characteristics and geotechnical aspects of the site. Following this investigation and preliminary discussions with the North Carolina Department of Environment and Natural Resources, it was decided to locate the building for the livestock center off of covered waste, and to use the covered waste area for parking and access.

From March 2011 to December 31, 2011, 13,283 head of cattle and 1,275 head of sheep and goats were sold with a sales value of \$9.1 million and an economic impact of \$13.65 million at the center. This equates to more than \$18.0 million annually. Key partners in this effort, Southwestern Commission in Sylva and Land-of-Sky Regional Council in Asheville, received a 2011 Innovation Award from the National Association of Development Organizations (NADO) Research Foundation for promoting the economic development in the region.

This effort could not have been accomplished without the generous support of the landowner, International Paper Company (IP), who provided a 99-year low-cost lease for the project area. IP supported the community by allowing the construction of the livestock center at the site. According to Tom Richardson, IP Remediation Program Manager, "International Paper is always looking for ways to reduce our footprint and impact." The maintenance and upkeep of the livestock center helps stabilize the site and reduce the potential for the landfill to pose a risk to human health and the environment. Richardson believes that there is now an appropriate use for the property that incorporates IP's focus on sustainability and stewardship of property and natural resources. This project has provided IP with an opportunity for public outreach and community involvement. IP may not be manufacturing in this location, but the livestock center has furthered IP's goal to be a good neighbor.

Site Potential

Owners of small-scale closed landfills and community leaders wishing to find sites for community development projects should take a new look at the potential these overlooked sites can provide. Assembling a team of qualified engineers and community organizations could result in a project that has tremendous benefit for years to come. | **WA**

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Transfer Stations

Applicable Regulations

TRANSFER STATIONS ARE AFFECTED BY A VARIETY OF FEDERAL, STATE, tribal and local regulations, including those related to noise, traffic impact mitigation, land use, workplace safety, taxes, employee right-to-know and equal employment opportunity that are applicable to any other business or public operation. Many jurisdictions also have regulations specifically applicable to transfer stations. These regulations typically emphasize the protection of public health and the environment.

Federal Regulations

No federal regulations exist that are specifically applicable to transfer stations. EPA, however, initiated a rulemaking process exclusively for marine waste transfer stations under authority of the Shore Protection Act in 1994. These rules would regulate vessels and marine transfer stations in the U.S. coastal waters. EPA is currently working with the U.S. Coast Guard on finalizing these rules.

State Regulations

State solid waste regulatory programs usually take primacy in transfer station permitting, although local zoning and land use requirements apply as well. State regulations vary widely. Some have no regulations specific to transfer stations; others mention them as a minor part of regulations that generally apply to solid waste management; and others have regulations specifically addressing transfer station issues such as design standards, operating standards and the maximum amount of time that waste can be left on site. A few states also require transfer stations to have closure plans and to demonstrate financial assurance, while others require certification of key personnel. Some states also require compliance with regional solid waste planning efforts or demonstrations of "need."

Local Regulations

Local regulation of transfer stations can take many forms. Typical regulatory bodies include counties, cities, regional solid waste management authorities, health departments and air pollution control authorities. Counties, cities and regional authorities are often required to prepare comprehensive solid waste management plans describing long-range plans for waste prevention, recycling, collection, processing (including transfer stations) and disposal. Other local regulations likely to apply to transfer stations include zoning ordinances, noise ordinances and traffic impact analysis.

Public health departments are involved with transfer stations because of the potential health concerns if solid waste is improperly managed. In some States, the State environmental protection agency delegates authority to local health departments to oversee solid waste management facilities, including transfer

stations. This typically includes overseeing general compliance with a facility's operating permit, regular cleaning of the tipping floor, limits on the amount of waste the facility can accept, and employment of adequate measures to prevent vectors such as rats, birds and flies from contacting waste.

Local or regional air pollution control authorities often regulate odor, dust and vehicle exhaust emissions at transfer stations. Air pollution control agencies might regulate chemicals used to control odor, exhaust from vents on the facility's roof or walls, and whether dusty loads can be delivered to the transfer station. The local sanitary district often establishes wastewater standards and might be involved in storm water management and protection.

Common Regulatory Compliance Methods

Compliance Inspections

Many transfer stations are inspected periodically for compliance with the transfer station's operating permit and other applicable regulations. The entity responsible for performing inspections and the frequency and level of detail of inspections vary widely around the country. Some inspections are complaint driven, some occur on a regular frequency, and some occur on a random basis. A typical inspection involves a representative of the local health department or state or tribal solid waste regulatory program walking through the facility, looking for improper waste storage or handling methods and writing up a short notice of compliance or noncompliance. Other inspections for specific issues are also conducted. Special inspections might target workplace safety, proper storm-water runoff management and compliance with applicable roadway weight limits for transport vehicles.

Reporting

Some transfer station operators are required to compile monthly, quarterly or annual reports for submission to regulatory agencies and host communities. These reports typically include the following information:

- Weight (tons) and loads (number of customers) received at the transfer station each month. This sometimes includes details such as day of the week, time of day, type of waste, name of hauler and origin of waste.
- Weight (tons) and loads (number of transfer truck shipments) shipped from the transfer station each month. This sometimes includes a breakdown by time shipped, type of waste and the final destination of the waste.
- A description of any unusual events that took place at the transfer station, including accidents and discoveries of unacceptable waste.
- A summary of complaints received and the actions taken to respond to the complaints.

— From www.epa.gov/osw/nonhaz/municipal/pubs/r02002.pdf.

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The new BC472RB refuse compactor from BOMAG (Kewanee, IL) offers the performance and durability of the company's larger machines, but in a more compact package. Ideal for smaller landfills, the 52,900-pound compactor offers a sealed frame design, outstanding operator comfort, easy maintenance access and superior compaction capabilities. Featuring BOMAG's exclusive PAKALL wheel design, the BC472RB uses polygonal compaction rings. The front wheel contains 50 teeth, and the rear wheel has 40. The machine eliminates air voids by shredding and crushing waste, allowing landfill operators to achieve greater density, preserve valuable airspace and extend the lifespan of their landfills.

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