Funding:
Get Educated About the Grant Funding Process Before you Apply Page 24.

Safety:
A Simple, Underused Tool That Can Transform Your Safety Culture Page 28.

Waste-By-Rail:
OT5: What It Is, Why It's Important Page 40.

Shop at the MarketPlace! Page 71.

Recycling/Transfer Stations/Landfills Section Page 53.

www.wasteadvantagemag.com December 2012 Vol.3, No.12

Waste Advantage magazine

The Advantage in the Waste Industry and Recycling Industry

THE CITY OF DENTON, TX SOLID WASTE AND RECYCLING DEPARTMENT
Turning Passion for Education Into Diversification and Strength

YEAR IN REVIEW: A LOOK BACK AT 2012

AN ORGANIZING APPROACH FOR ENTITLING WASTE PROJECTS


MERRY CHRISTMAS AND
HAPPY NEW YEAR!
HOLTZ
INDUSTRIES, INC.
CALL TO PLACE YOUR ORDER TODAY! 1-800-535-0104
Ramsey WINCH
BLOOM
REEVING SYSTEMS IN STOCK!
WE SELL
CABLES AND
ROLL-OFF
CABLES TOO!
WINCHES AVAILABLE IN
8,000 & 12,000 ILBS.
WE STOCK A
VARIETY OF PANELS!
CALL TODAY
FILTERS AND
FILTER CARTS
REPLACEMENT LIDS
AND CONTAINER PARTS
RAYCO
CONTAINER
LIDS
WASH OUT TANK KITS
ALUMINUM & STEEL AVAILABLE
NEED JUST
THE BODY?
WE CAN DO
THAT TOO!
CONTAINER CARRIERS AND
ROTATOR ATTACHMENTS
ROLL-OFF HOIST BODIES
VARIOUS BRANDS OF
REAR-LOAD PACKER BODIES
HOOK-LIFT
HOIST BODIES

One Stop Shopping For Your Replacement Parts
REPLACEMENT PARTS SOLD FOR: HEIL • LEACH • EZ-PACK • MCNEILUS • DEMPSTER • PAK-MOR • GALBREATH • G&H • KPAC • CRANE CARRIER • WAYNE • LOADMASTER • NEW WAY • LABRIE • MARATHON • ACCURATE • PIONEER • O'BRIAN • BAYNE • PERKINS • SLENDERLINE • AND MUCH MORE!!
1-800-535-0104 | (740) 366-4002 | WWW.HOLTZINDUSTRIES.COM
PERMCO
CALL DAVE HANES FOR ALL YOUR HYDRAULIC NEEDS! EXT: 207
Parker Chelsea
MUNCIE
PUMPS
LIGHTING
RH Lighting
Custom Hoists, Inc.
Commercial Hydraulics
HYCO
RayView® Camera Systems
AIR CONTROLS
CAMERA SYSTEMS
WE OFFER:
• REAR LOAD CONTAINERS
• CARTS AVAILABLE IN 68 AND 95 GALLON IN STOCK READY FOR IMMEDIATE DELIVERY!
• CART LIFTERS ALWAYS IN STOCK!
CHECK WITH US FOR ALL YOUR HYDRAULIC CYLINDER NEEDS
PACKING KITS
STRAINERS
ROLLERS
PINS
WIPER BLADE ASSY. TUBES
PIVOT ASSY.
BRIDGE ASSY. AND PARTS
LEVERS
CYLINDERS
CLAMP SHOES
PACKING PANELS
PUSH OUT SHOES
TIE DOWNS
BUSHINGS
T/G SEAL
PUSH OUT BARS
STRAPS
CONTROL RODS
CARTRIDGE VALVES
BUSHINGS
HOPPER FLOOR
YOKES
SLIDE SHOE KITS
FILTERS
TAILGATE LATCH
PACKING KITS
SWITCHES
PINS
LEVERS
CYLINDERS
VALVES
HEIL
GAR WOOD
WINCHES
LEACH
DEMPSTER
DRY VALVE PUMPS
E-Z PACK
DUAL PUMPS
2 STAGE
3 STAGE
4 STAGE
5 STAGE
6 STAGE
TRANSFER TRAILERS
FILTERS
PINS
BUSHINGS & BEARINGS
SLIDES
T/G SEALS
CARTRIDGE VALVES
LINKS
LEVERS
SWITCHES
BOTTLE PIN
PIVOTS
BUMPERS
SPRINGS
SOLENOIDS & RELAYS
T/G LATCH
SLIDE SHOES
VALVES
HOPPER FLOORS FACE PLATES SIDE LINERS
CYLINDERS
NOTICE
CAUTION
PERKINS
CHECK OUT OUR ADS ON PAGES 84-87!
CLICK HERE FOR MORE INFORMATION!

Editor's Note

HAPPY HOLIDAYS TO EVERYONE! I CAN'T BELIEVE IT IS THAT TIME AGAIN AND that we are wrapping up the final issue of 2012. Time seems to be moving forward faster than ever these days. Since this is the time when there is more of everything, be sure to put all of that extra trash (paper, plastics, cardboard, etc.) in the proper place and encourage your residents to do the same.

The last issue of 2012 has a lot of great articles. It includes a Year in Review, where our own editorial advisory board talks about what significant events happened these past months and looks ahead to the future to discuss the outlook of the waste and recycling industries (page 20). This month, we also spotlight the City of Denton, TX's Solid Waste & Recycling Department, whose partnerships and outreach programs have diversified and strengthened its services, while educating the public about their sustainable projects and environmental responsibility (page 14). And don't miss "Get Educated About the Grant Funding Process Before You Apply" (page 24), an article that focuses on how educating yourself will likely increase your chance of using grants as a financial tool. Also check out "An Organizing Approach for Entitling Waste Projects" (page 38), which discusses ways that readers can engage the public and mobilize their resources when they find opposition to a certain project. Other great articles include, the third part of the Power Take-Off series (page 32), a simple tool that you can use to transform your safety culture (page 28) and a focus on OT5 when using Waste-By-Rail (page 40). All are informative and worth checking out in this packed issue.

Speaking of packed segments, don't forget to check out our Recycling/Transfer Stations/ Landfills section, where you can find even more articles that focus on these three subjects (page 53). From going beyond waste diversion to combating leaking landfills, there are great articles for everyone.

Soon it will be trade show season and we will be gearing up to see all of you again. We are looking forward to it. Have a great New Year's!

Best Regards,

Angelina Ruiz
Editorial Director
angelina@wasteadvantagemag.com

WasteAdvantage magazine
The Advantage in the Waste and Recycling Industry

PUBLISHER
Gary Orfe
gary@wasteadvantagemag.com
(800) 358-2873 Ext. 2

EDITORIAL
Editoral Director
Angelina Ruiz
angelina@wasteadvantagemag.com
(800) 358-2873 Ext. 7

Associate Editor
Meghan Pirone

ART/PRODUCTION
Director of Production/Design
Heidi Jensen
heidi@wasteadvantagemag.com
(800) 358-2873 Ext. 8

CIRCULATION
Circulation
Elisa Weil
elisa@wasteadvantagemag.com
(800) 358-2873 Ext. 5

SALES
Sales Manager
Noreen Cocron
(800) 358-2873 Ext. 1
noreen@wasteadvantagemag.com

Account Executive
Marcus Rubio
(800) 358-2873 Ext. 3
marcus@wasteadvantagemag.com

Account Executive
Eddie Alvear
(800) 358-2873 Ext. 4
eddie@wasteadvantagemag.com

ACCOUNTING
Accounting Manager
Elisa Weil
elisa@wasteadvantagemag.com
(800) 358-2873 Ext. 5

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

Waste Advantage Magazine (ISSN # 2150-8429) is published 12 times per year, January, February, March, April, May, June, July, August, September, October, November and December.
A controlled circulation publication, *Waste Advantage Magazine* is distributed without charge to 25,000 qualified subscribers in the United States and Canada. Non-qualified subscription rates in the United States and Canada: $48.00 per year. All other countries: $200.00 per year payable in U.S. funds. Single copies $15.00 per issue in the United States and Canada. All other countries $18.00 per issue.

Editorial contributions are accepted from the waste industry. Contact the editor for details. Product/service information should be submitted in accordance with guidelines available from the editor. Advertising close is 30 days prior to the month of publication.
CHANGE OF ADDRESS REQUESTS MAIL TO:
Waste Advantage Magazine, Attn: Circulation,
PO BOX 30126, PALM BEACH GARDENS, FLORIDA 33420-0126
PRINTED IN THE U.S.A.

THE Curotto-Can

HIGHEST PRODUCTIVITY
SAFEST SYSTEM
@ the LOWEST COST

HIGHEST PRODUCTIVITY At 4-5 seconds the Curotto-Can AFL has the fastest load time of any automated system. Fast loading translates into a 25%-30% productivity advantage. The AFL is also the only true "take-all" system capable of handling large bulk (such as furniture and mattresses), green waste and flattened oversize cardboard.

SAFEST SYSTEM Eyes Forward Ergonomics is the safest for the operator as it eliminates repetitive strain injury associated with constantly looking back. Operators can also see and remove contamination. You can stop contamination - before its packed - at the curb. Reduce waste stream contaminants to less than 5%.

LOWEST COST The Curotto-Can AFL replaces: the ASL, the recycler, the rear loader, and the carry can/tipper. Standardize the fleet with the AFL and significantly reduce the total number of units. The Curotto-Can can be mounted or dismounted in less than 5 minutes. Swap out quickly and eliminate truck downtime due to arm problems.

The Commercial Gripper is capable of handling the heaviest of carts. Haulers use the Commercial Gripper to collect 96 gal carts while on route collecting commercial 2-5 yd bins thus eliminating a "chase" truck. With the Commercial Gripper, one unit does it all!

Call for our new fact-filled brochure and DVD package that explains all the advantages of the AFL system.

(707) 939-2802

www.thecurottocan.com

CLICK HERE FOR MORE INFORMATION!

In This Issue

December 2012 Volume 3, Number 12

On the Cover:
The City of Denton Solid Waste & Recycling Department's cart collection truck.

Photo courtesy of the City of Denton, TX Solid Waste & Recycling Department.

In Every Issue:

Photo courtesy of Photos courtesy of Heil.,Tealinc. and Geo-Logic Associates.



THE MOST RUGGED SIDE-LOADER ON EARTH
SIDEWINDER
IRONCLAD PERFORMANCE
More dependability. Longer lifespan. Heavier payloads. The New Way Sidewinder™ puts your fleet in a position of power. Built for punishment, your crew can keep on operating while other trucks are in the shop. So while this truck is tough, it makes one thing not so tough—the decision to add one to your fleet.
See the improvements at newwaytrucks.com/Sidewinder
NEW WAY
Driving The Difference.
A Product of Scranton Mfg. Co., Inc. · 101 State Street · Scranton, IA 51462 · T 800 831 1858 · F 712 652 3399 · www.newwaytrucks.com · Proudly USA Made
CLICK HERE FOR MORE INFORMATION!
2938:16

Waste Pro Recognizes Two-Time Safety Award Recipient

WASTE PRO (Longwood, FL) recognized its first two-time Safety Award recipient, driver Angel Veloz, who picked up his second $10,000 check in late September. Angel received his first $10,000 Safety Award in 2009. Waste Pro's Safety Award is given to individuals who have, for a three year period, recorded no injuries, accidents or property damage, received no customer complaints, have provided excellent customer service, and have a well-maintained truck and positive attitude. Angel has been a part of the Waste Pro team since 2006 and was recognized last year with the Values Champion Award at the company's Annual Manager's Meeting. John J. Jennings, President/CEO, stated, "We care deeply about our employees, customers and communities we serve. At Waste Pro, safety is paramount and I look forward to distributing many more of these bonuses."

For more information, call (407) 869-8800 or visit www.wasteprousa.com.

New Single-Stream Recycling Center Opens in New York

A state-of-the-art, 30,000 square-foot, single-stream recycling center has opened for business in the growing Southern Tier of New York. A local family owned waste company, **TAYLOR GARBAGE SERVICE INC.** (Vestal, NY) and their subsidiary company, Southern Tier Recyclers, came together to create the new facility which is operated by Southern Tier Recyclers. The facility includes both mechanized and hand sorting for maximized material recovery from the waste stream. The specialized sorting and identification equipment created by Green Machine, Inc. allows the plant to process up to 25 tons per hour of mixed recyclable materials. The advent of this facility will allow for expansion into new territories and the opportunity to bring recycling to areas that do not currently enjoy a recycling program of any kind. The company anticipates at least a 20 to 30 percent increase in participation with the switchover to a fully no-sort curbside pickup of recycling—a great asset to an area that already enjoys one of the best recycling programs in the U.S.

For more information, call (607) 797-5277 or visit www.taylorgarbage.com.

Heil Sanitation Worker Appreciation Event Promotes Safety and Community Awareness

HEIL ENVIRONMENTAL sponsored a public Sanitation Worker Appreciation Celebration in downtown Chattanooga, TN on November 30. The event was held in conjunction with the one-year anniversary of Heil's Sanitation Worker Appreciation Program (SWAP!), which provides company employees and local residents with an opportunity to let Sanitation Workers know how much they appreciate the work that they do to keep their neighborhoods clean. The public event was the first of its kind for Heil's SWAP! effort. The City of Chattanooga closed off streets and local municipalities and haulers brought in their Heil units to display. Heil's vintage Colecto-Pak was also on display and kids were able to get their photos taken with Santa and the truck. In addition, Heil employees handed out safety tips to educate residents about staying safe around garbage trucks in their neighborhoods.

For more information, visit www.facebook.com/HeilEnvironmental or www.heil.com.

Progressive Waste Solutions Ltd. Acquires Choice Environmental Services, Inc.

PROGRESSIVE WASTE SOLUTIONS LTD. (Toronto, ON) announces it has acquired, through its wholly owned subsidiary Waste Services of Florida, Inc., Choice Environmental Services, Inc. for cash consideration of $123.25 million. Choice Environmental is a solid waste services company based in Fort Lauderdale, FL, and a wholly owned subsidiary of Swisher Hygiene. "As one of the largest independent waste and recycling service providers in Florida, Choice Environmental brings residential, commercial and industrial collection operations, along with transfer and material recovery facilities, that are well-positioned in southern and central Florida," said Joseph Quarin, Vice Chairman and Chief Executive Officer, Progressive Waste Solutions. "We are very pleased to add these assets, which strongly complement our existing collection and disposal footprint in Florida, to our growing network." Choice Environmental generates annual revenue of approximately $72 million through six collection operations, one municipal solid waste transfer station and one Material Recovery Facility.

For more information, visit www.progressivewaste.com.

Mark Your Calendar

JANUARY 2013

22 – 23: 5th Annual Kuwait Waste Management Conference & Exhibition
Radisson Blu Hotel
Kuwait City, Kuwait
www.promediakw.com/2013/waste

28 – 30: Managing Recycling Systems Training
Florida Hotel and Conference Center
Orlando, FL
www.swanafl.org

28 – 31: U.S. Composting Council 21st Annual Conference & Trade Show
Buena Vista Palace Hotel and Spa
Lake Buena Vista-Orlando, FL
www.compostingcouncil.org/conference

29 – 31: 16th Annual LMOP Conference and Project Expo
Hilton Baltimore
Baltimore, MD
www.epa.gov/lmop/workshops/16th.html

30 – 31: SWANA FL/RFT (Recycle Florida Today) Joint Summit
The Florida Hotel and Conference Center
Orlando, FL
www.swanafl.org

31 – February 1: Mia Green Expo and Conference
Miami Beach Convention Center
Miami Beach, FL
www.miagreen.com

FEBRUARY 2013

29 – February 4: SeminarFest
The Flamingo
Las Vegas, NV
www.asse.org/education/seminarfest12

24 – 28: WM Symposia
Phoenix Convention Center
Phoenix, AZ
www.wmsym.org

25 – 26: The Road to Zero Waste Conference
Atlanta, GA
www.swana.org

MARCH 2013

6 – 8: The Work Truck Show
Indiana Convention Center
Indianapolis, IN
www.ntea.com

10 – 13: 26th Southeast Recycling Conference & Trade Show
Hilton Sandestin Beach Golf Resort & Spa
Destin, Florida
www.southeastrecycling.com

18 – 20: SWANA's 36th Landfill Gas Symposium
Las Vegas, NV
www.swana.org

19 – 20: Plastics Recycling Conference
Sheraton New Orleans
New Orleans, LA
www.plasticsrecycling.com

19 – 21: Americana 2013: 10th International Environmental Technology Trade Show and Conference
Palais Des Congres De Montreal
Montreal, QC
http://americana.org

21 – 23: Mid-America Trucking Show
Kentucky Exposition Center
Louisville, KY
www.truckingshow.com

APRIL 2013

8 – 10: Waste & Management Recycling India 2013
India Expo Centre
Greater Noida Expressway, Delhi
www.wmrindia.com

8 – 10: International Biomass Conference & Expo
Minneapolis Convention Center
Minneapolis, MN
www.biomassconference.com

Government Gossip

Plastic Bottle Recycling Continues to Climb

Plastic bottle recycling by consumers increased 45 million pounds in 2011, edging up 1.7 percent, to reach over 2.6 billion pounds for the year, according to figures released jointly by the Association of Postconsumer Plastic Recyclers (APR) and the American Chemistry Council (ACC). The recycling rate for plastic bottles held steady, inching up one-tenth of 1 percent to reach 28.9 percent for the year

The report marks the 22nd consecutive year that Americans have increased the pounds of plastic bottles returned for recycling. Domestic processing of all recycled plastic bottles—including imported materials—rose 89 million pounds over 2010. The report verified that single-stream collection—whereby all recycled materials are placed in a single bin—continues to grow, helping to boost household participation rates.

This year's survey also found that the recycling of PP bottles rose to nearly 44 million pounds, an annual increase of nearly 24 percent, with 64 percent of that material processed domestically as PP, rather than mixed with other resins. Additionally, the report showed that the pounds of HDPE bottles collected dipped slightly (1 percent) in 2011, while the collection rate for HDPE held steady at 29.9 percent. Imports of postconsumer HDPE increased by 106 percent to 51.1 million pounds, which, combined with decreased collection and fallen exports, resulted in slightly higher production in U.S. reclamation plants. PET and HDPE bottles continue to make up over 96 percent of the U.S. market for plastic bottles.

The full 2011 National Post-Consumer Plastics Bottle Recycling Report is available in the "Reports and Publications" section of ACC's Web site at http://plastics.americanchemistry.com/Education-Resources/Publications and on APR's Web site at www.plasticsrecycling.org.

SWANA Comments on Court's Permanent Injunction on the Dallas Flow Control Law

John H. Skinner, Ph.D., Executive Director and CEO of SWANA, issued the following statement on the October 16 decision by the U.S. District Court to issue a permanent Injunction on the flow control ordinance enacted by the City of Dallas, TX: "Judge O'Connor's permanent Injunction opinion is not surprising given what he said when he handed down the preliminary injunction last January. He stuck by his earlier thinking that the ordinance impairs the plaintiffs' franchise rights under the Contracts Clause of the U.S. Constitution and also found that the ordinance violated Texas law and the Dallas city charter. The city now needs to decide whether to appeal the decision to a higher court.

"The important point, however, is that this decision in no way undermines the constitutional right of local governments to enact ordinances to require haulers to deliver locally generated solid waste to publically owned transfer or disposal facilities, as upheld by the U.S. Supreme Court in the 2007 United Haulers decision. The judge's ruling is based on how he interprets the hauler franchise agreements at question in this case as well as state and city law issues. Therefore, it's hard to say how the decision might resonate elsewhere in Texas, not to mention other parts of the country. The Dallas decision does emphasize that when local governments institute flow control ordinances they need to be vigilant in observing state and local legal requirements and existing franchise agreements.

"SWANA continues to believe that flow control can be an effective and legitimate instrument of integrated municipal solid waste management. To the extent it is allowed by law and after public discussion, including the consideration of economic, environmental and social impacts, and input from residents, businesses, and other interested parties, flow control can be implemented without unduly interfering with the free movement of municipal solid waste and recyclables across jurisdictional boundaries."

For more information, visit www.swana.org.

Solid Waste Industry Issues Guidelines to Avoid Distracted Driving

The Environmental Industry Associations (EIA) has issued its "Distracted While Driving" white paper to member wastes services companies nationwide to support the industry's efforts to avoid driving distractions, which occur whenever drivers take their hands, eyes, ears and minds off the wheel and the road. "Safety should be the top priority for anyone getting behind the wheel of a vehicle, and that includes the 150,000 commercial truck drivers employed by the solid wastes services industry," said EIA President and CEO Sharon H. Kneiss. "As partners with American communities, our members must continue to emphasize safety in lockstep with high-quality service. That includes the public's safety as well as the safety of industry drivers."

Activities that distract drivers include reading, eating and drinking, operating navigation systems, talking with passengers or using cell phones to talk, text or surf the Web. The U.S. Department of Transportation (DOT) says distracted driving contributed to 18 percent of all injury crashes in 2010, causing more than 3,000 deaths and more than 416,000 injuries.

Cell phone use while driving is of particular concern when combating distracted driving. Research cited by the white paper finds that cell phones used for texting can increase fatal crashes from six to 23 times, and drivers using handheld devices are four times more likely to become involved in crashes serious enough to injure themselves. DOT has banned the use of a handheld device while driving and has prohibited texting while driving. The white paper recommends company drivers avoid distracting activities, turn off their phones and set aside time during the day to make work-related calls or texts. "It is important for everyone to learn and observe local and state safety laws, our drivers included," said Kneiss. "It may be tempting to use the phone or to text while driving, but it is also easy to avoid."

For more information on the "Distracted While Driving" white paper, download a copy at www.environmentalistseveryday.org/distracted-driving.

OSHA Offers Free Onsite Assistance to Small Businesses

OSHA's Onsite Consultation Program offers free and confidential health and safety advice to small and medium-sized businesses in all states across the country, with priority given to high-hazard worksites. Each year, responding to requests from small employers looking to improve workplace health and safety and their safety and health management programs, OSHA's Onsite Consultation Program conducts over 29,000 visits to small business worksites covering over 1.5 million workers across the nation.

Onsite consultation services are separate from enforcement and do not result in penalties or citations. Consultants from state agencies or universities work with employers to identify workplace hazards, provide advice on compliance with OSHA standards, and assist in establishing safety and health management programs.

For more information, to find the local Onsite Consultation office in your state, or to request a brochure on Consultation Services, visit www.osha.gov/dcsp/smallbusiness/consult.html.

Keep your trailers on the road.
Especially when there is no road.

RANCO

End Dumps
34 ft.
38 ft.

Lightweight Bottom Dumps
40 ft.
42 ft.

Parts

Construction worksites are a wilderness of hazardous terrain, rough conditions and heavy hauls – the perfect setting for Dragon's Ranco trailers. Ranco units are known for their strength and durability, so it's only natural that they are now a part of Dragon. Everything we make is severe-duty engineered to perform through the harshest conditions, day after day. Plus with our trailers, above-standard features come standard, such as all four wheels remaining on the ground while dumping and truss design draft arms on end dumps, larger hoppers and pin-setting equalizers on bottom dumps that increase productivity. Backed by the strength and stability of Dragon, a family-owned company that builds its products right here in the U.S. You get high integrity, high availability and high-speed delivery, so you can minimize downtime. And you get Dragon's team of experts backing your business. Dump trailers that keep working, so you can too.
Make it happen.

1-877-231-8198

www.dragonproductsltd.com

DRAGON
Make it happen.

U.S. owned and operated. Founded in 1963.

CLICK HERE FOR MORE INFORMATION!

The City of Denton, TX Solid Waste & Recycling Department: Turning Passion for Education into Diversification and Strength

Nurturing unique partnerships and outreach programs that help diversify and strengthen its services, DENTON'S SOLID WASTE & RECYCLING DEPARTMENT IS PASSIONATE ABOUT EDUCATING THE PUBLIC with regards to sustainable projects and environmental responsibility.

DENTON, TX IS A CULTURALLY DYNAMIC CITY that boasts a charming, historic downtown, unique shopping and dining, a vibrant, live music scene and a strong environmental consciousness. The city's diverse community is supported by two universities, several major manufacturing companies, and a thriving health and medical industry. Denton is located 40 miles north of Dallas and is one of the fastest growing cities in the nation with a population of approximately 113,000.

Denton's city council formed the Solid Waste Master Plan Advisory Committee in 1992 in order to accommodate long-term growth. The committee examined waste streams, waste management practices, community needs and recycling strategies for waste minimization, and established a 20-year integrated solid waste master plan under which the City of Denton Solid Waste & Recycling Department now operates.

The Solid Waste & Recycling Department employs 110 people and has a fleet of 80 vehicles servicing the City of Denton. The department manages municipal solid waste, and Class 2 and 3 nonhazardous, industrial waste, and household hazardous waste. Collection services include: residential curbside waste and recycling, recycling drop-off centers that support multi-family residents and small businesses, commercial waste, recycling and food waste, and household hazardous waste. Other department services include a Home Chemical Reuse Store, Building Materials Recovery program and a landfill gas-to-energy program.

Staying Strong in a Weak Economy

The 2008 housing construction market downturn did not negatively impact the Solid Waste & Recycling Department's operations, because the commercial construction market became increasingly involved in generating recyclable building materials through

Right: Volunteers collect unwanted medications from citizens at a Denton Drug Disposal Day event.
Below: Solar-powered recycling and trash compactors on the Denton Square.

Photos courtesy of the City of Denton Solid Waste & Recycling Department.

The Dyno Dirt composting operation is a result of a partnership between the City of Denton Solid Waste and Recycling and Wastewater departments.

PROGRAM DESCRIPTIONS

The **Bicycle to Recycle Tour** is a community bike ride that highlights clean-air transportation and recycling. The bike ride begins on the Denton Square and stops to tour the Pratt Materials Recovery Facility to see how recycling is sorted and bailed.

Keep Denton Beautiful's **Annual Tree GiveAway** provides free trees to City of Denton residents in celebration of national Make a Difference Day.

The City of Denton Solid Waste & Recycling Department's award winning **Sustainable Schools Program** was developed in 2005 to assist schools in environmental education and sustainable practices. The vision of the program is to inspire youth and their families to value and participate in a sustainable world through education, outreach, collaborations and community partnerships. In 2009, the Sustainable Schools Program won the U.S. Conference of Mayors' Outstanding Achievement Award for City Livability.

the U.S Green Building Council's Leadership in Energy and Environmental Design (LEED) programs. LEED project examples are Apogee Stadium at the University of North Texas and a Fitness and Recreation Center at Texas Woman's University. These projects and others like them helped the department to increase its waste diversion rate. According to Solid Waste & Recycling General Manager, Vance Kemler, "In the last three years the department has increased its waste diversion rate from 26 percent to 30 percent. In the last year, the department created a Building Materials Recovery program (BMR) to accommodate the increased amount of building materials entering the landfill. The program recycles C&D material such as concrete, metal and wood. The BMR currently diverts 50 percent of the material it processes from the landfill."

Partnerships and Programs

The Solid Waste & Recycling Department has unique partnerships and outreach programs that help diversify and strengthen its services. In 2008, the department partnered with DTE Biomass Energy to install a landfill gas collection system. The system covers the entire 63-acres of current landfill space, capturing gas, which is directed to an onsite DTE 1.6 megawatt electric power generator. The energy is then transferred onto the Denton Municipal Utilities electric grid where it is used to power approximately 1,600 Denton homes. "As a result, Solid Waste & Recycling receives a portion of gross utility sales to Denton Municipal Electric, the City's electric department and the site has space to add two more generators," Kemler says. Over the past few years, research projects have been conducted by the University of Texas at Arlington to monitor moisture distribution and determine the efficiency of leachate recirculation systems in the landfill to enhance gas production.

In addition, the City of Denton Wastewater Department partners with the Solid Waste & Recycling Department on a project that diverts bio-solids and yard waste from the landfill and converts those materials into a compost product called Dyno Dirt. A variety of Dyno Dirt products, including Dyno Landscape Mulch and Dyno Soil, is sold to the general public.

Studies conducted by the City of Denton and the University of North Texas show that compounds found in pharmaceuticals flushed down toilets are not removed during the wastewater treatment process, and are persistent in the environment. These compounds could possibly affect aquatic life and drinking water. For this reason, the Solid Waste & Recycling Department created the "Denton Drug Disposal Day" (D4) pharmaceutical take-back program in 2010 in order to respond to citizen concerns regarding disposal of unused medications. The Department's Home Chemical Collection Program has hosted D4 events to collect unwanted and expired medications from Denton residents. Four scheduled events over a two-year period (2010 to 2011) collected and properly disposed of 2,556 pounds of unwanted medications. D4 has won several awards from organizations such as the Solid Waste Association of North America (SWANA), the Texas Chapter of the Solid Waste Association of North America (TxSWANA), the North American Hazardous Materials Management Association (NAHMMA), the State of Texas Association for Recycling (STAR) and the Greater DFW Recycling Alliance.

Household Hazardous Waste Supervisor, Victoria Hodge says, "The program ended up being so successful that it led to the installation of a public drug disposal kiosk at the City of Denton Police Department."

Public education and community outreach are the keys to the success of the Department's programs. Alana Presley, Department's Education Coordinator has a passion for educating the public about how the City of Denton is different than others with regards to sustainable projects and environmental responsibility. "We partner with local businesses, universities and non-profits on events such as the Bicycle Recycle Tour with Scrap Denton and Querencia Community Bike Shop and a Tree Giveaway with Keep Denton Beautiful. Our Sustainable Schools program, which includes 34 Denton area schools, provides a platform for sustainable education to students, teachers and administrators," Presley says. A recent Sustainable Schools workshop brought local teachers and non-profits together to share ideas for reuse education and practice (see Program Descriptions sidebar, page 16).

Teachers create scrap material boxes for their classrooms and share ideas for communicating reuse principles to students.

Safety and Training

Employee training and certification requirements meet City of Denton policies and Texas Commission on Environmental Quality (TCEQ) rules. The TCEQ Chapter 30 Texas Administrative Codes that the department adheres to are Municipal Solid Waste Occupational Licensing, Industrial & Hazardous Waste, and Waste Minimization & Recycling. Additionally, training and safety meetings are scheduled once a month for all employees and a variety of topics are covered, which include: fire protection, prevention, and evacuation, emergency response and personal protective equipment. Employees are evaluated annually by supervisors to ensure that they receive appropriate job training.

Successes and Challenges

Introducing new services and guidelines to citizens and encouraging their participation can be challenging. "When our curbside recycling pilot program began, it was expected to be met with some citizen resistance," Kemler said. However, despite these initial concerns, the service ended up having a 70 percent participation rate in the first year due to a large portion of the community's desire to recycle as well as an intensive marketing and public education campaign, which used television and movie theater advertising, utility bill stuffers, newspaper advertising and residential service guides mailed to homes.

A recycling program without a nearby processing facility was difficult to justify because transportation and labor costs outweighed the revenue. In 2011, a Materials Recovery Facility (MRF) allowing

Construction materials recovered by the Building Materials Recovery program.

for a closed-loop lifecycle for local recyclable materials was created in Denton through a public-private partnership with Pratt Industries. Pratt is America's fifth largest box manufacturer and the world's largest, privately-held 100 percent recycled paper and packaging company. As a result, Denton boasts achieving a closed-loop lifecycle for recycled cardboard. "When a Denton resident places a cardboard box into a blue recycling cart, it is taken to the local Pratt MRF. At the MRF, the box is bailed with other cardboard materials and shipped to a paper mill in Shreveport, LA where it is then processed into a roll of paper," Presley says. "The paper roll is then sent to a Pratt Box Plant in Fort Worth and made into a new box. The cycle is completed as the box gets delivered to a home improvement store in Denton where a resident buys it to move furniture."

Upcoming Programs

Conserving landfill space and resources are important goals of the Solid Waste & Recycling Department. Currently, the Department faces the challenge of finding cost-effective solutions for building materials and food waste diversion. "The volume of wood waste is high, but the accessible markets for the product are few and not very diverse. Converting food waste into feed for livestock provides the highest market value for the product; but transportation costs outweigh the revenue. Making compost is another valuable use for food waste. The challenge is finding enough clean food waste to meet the market demand," Kemler says. A current pilot program uses pre-consumer food waste from local grocery stores to enrich the Dyno Dirt compost product.

For now, the Solid Waste & Recycling Department is focusing on its long-term plans, which are, says Kemler, "Landfill mining, or recovering recyclables from old landfill cells, increasing selectivity for gas-generating materials that enter the landfill, and researching alternative energy programs." | WA

For more information about the City of Denton Solid Waste & Recycling Department, contact Vance Kemler, Solid Waste and Recycling General Manager, at Vance.Kemler@cityofdenton.com.

WasteStickers.com

Print Solutions for Waste and Refuse Management

Decals!

Decals - Stickers - Labels

Same Day Shipping on Hundreds of Products!

www.WasteStickers.com

800.331.9061

Custom Decals

ABC
WASTE
777-7777

250 Custom 2 Color Decals 18 x 24" *$443.00!*
500 Custom 2 Color Decals 12 x 18" *$433.00!*

Please call for a custom quote!

Roll Off Containers Top Sellers

Caution/Notice Combo Decal

CAUTION — DO NOT PLAY IN, ON OR AROUND OR OCCUPY THIS CONTAINER FOR ANY PURPOSE
NOTICE — CONTAINER MUST BE PLACED ON HARD, LEVEL SURFACE LOAD UNIFORMLY

WD514101
Size: 5 X 14" *Price: .69 each*

MAXIMUM LOADING LEVEL

WS336102

MAXIMUM LOADING LEVEL

9 x 12" Recycling & Container Decals

Price: .59 each

WS912104
Commingled Recyclables
- Aluminum Cans
- Glass Bottles & Jars (Green, Brown, Clear)
- Metal Cans
- Plastic Beverage Containers

ONLY

WS912101
ALL CANS AND BOTTLES MUST BE EMPTIED AND RINSED BEFORE PLACING IN RECYCLING CONTAINERS

WS912102
CARDBOARD ONLY BREAKDOWN BOXES

WS91213
NO GARBAGE
RECYCLABLE ITEMS ONLY

WS912122
RECYCLE HERE

WS912110
Mixed Paper Recyclable Products Only
- Corrugated Cardboard
- Computer Paper
- Books · Envelopes
- Spiral Notebooks
- File Folders
- Magazines
- Newspapers
- Office Paper
- Phone Books

Circle Recycling Decals

WS6X6101 6 X 6" *.59 each*
WS8X8101 8 X 8" *.69 each*
WS12I101 12 X 12" *.79 each*
WS18I101 18 X 18" *1.79 each*

Caution, Notice, & Danger Decals — Size: 5 X 7" — *Price: .38 each*

WDNOT101	WDNOT109	WDNOT103	WDNOT112	WDNOT113	WDNOT106	WDNOT116
NOTICE DO NOT FILL ABOVE TOP OF CONTAINER	NOTICE NO RECYCLABLES ALLOWED	NOTICE CONTAINER MUST BE PLACED ON HARD, LEVEL SURFACE LOAD UNIFORMLY	NOTICE IT IS AGAINST THE LAW TO PUT HAZARDOUS OR TOXIC WASTE IN THIS CONTAINER	NOTICE ALL TRASH MUST BE PUT IN THE CONTAINER	NOTICE PLEASE CLOSE COVERS	NOTICE NOT FOR PUBLIC USE VIOLATORS WILL BE PROSECUTED
WDCAU101	WDCAU106	WDCAU111	WDCAU114	WDCAU115	WDCAU116	WDCAU122
CAUTION DO NOT PLAY IN, ON OR AROUND OR OCCUPY THIS CONTAINER FOR ANY PURPOSE	CAUTION KEEP HANDS CLEAR OF THE HOPPER	CAUTION KEEP OUT	CAUTION THIS COMPACTOR STARTS AUTOMATICALLY	CAUTION BEFORE OPENING DOOR TURN CONTROL PANEL KEY SWITCH TO OFF POSITION, REMOVE KEY AND BLOCK OFF TRASH CHUTE	CAUTION THIS BALER STARTS AUTOMATICALLY	CAUTION DO NOT PLAY IN OR AROUND
WDDAN103	WDDAN102	WDDAN104	WDDAN105	WDDAN107	WDDAN112	WDDAN115
DANGER STAND CLEAR WHEN TAILGATE IS OPEN	DANGER STAND CLEAR WHEN CONTAINER IS OFF GROUND	DANGER FREQUENT STOPS AND BACKING	DANGER DO NOT ENTER	DANGER DO NOT PARK IN FRONT OF THIS CONTAINER	DANGER STAND CLEAR WHEN REAR DOORS ARE OPENED	DANGER 220 VOLTS

Recycling Message Decals — Size: 3 X 18" — *Price: .49 each*

WD318107	WD318117	WD318118	WD318131
ALUMINUM CANS ONLY	CANS, PLASTICS & BOTTLES ONLY	CARDBOARD ONLY	FLATTEN BOXES
WD318132	WD318133	WD318134	WD318140
GARBAGE ONLY	GLASS ONLY	GLASS, PLASTIC, ALUMINUM	MIXED PAPER ONLY
WD318150	WD318159	WD318160	WD318165
PAPER ONLY	PLASTICS ONLY	RECYCLE	TRASH ONLY

800.331.9061

CLICK HERE FOR MORE INFORMATION!

www.WasteStickers.com

2012: Year in Review

A look back at the good, the bad and the changing.

THE WASTE AND RECYCLING INDUSTRIES SAW AN INTERESTING year—from acquisitions to recycling growth and issues like safety and flow control, there was a slew of transitioning areas that become front page news. Although some of them have yet to be fully tackled, there are others that are in the middle of making significant changes to what the industry professionals now know. Some of the most important issues are discussed below as well as the outlook for 2013, which should be promising.

Waste and Recycling Changes

In 2012, the waste industry saw many of the smaller hauling companies go by the way of the larger ones. It seemed that every month, there was a new press release about a well-known player in the industry bowing out of the competitive arena. "Overall, the waste industry has remained the same except that there are fewer and fewer players, especially in the New York area," says Sal Tagliavia, President of Sanitation Repairs (Brooklyn, NY). "Everything is going towards national companies and individual operators are finding it harder to afford to stay in business."

On the other hand, the recycling industry saw even more growth than ever before this year. More than ever, communities are finding ways to move into single-stream or even curbside recycling programs in order to streamline their hauling process. Drew Weil, Account Representative for Sunbelt Hydraulics (Pompano Beach, FL), says, "In many cases, this move allows haulers to go from 18-gallon bins to 65 or 96-gallon carts, further reducing required collection days. This not only reduces the waste stream, but also has increased the set out rate and the household volumes, resulting in huge savings."

In addition, Tagliavia and Bob Wallace, Principal and VP of Client Solutions at WIH Resource Group, point out that while cardboard and scrap metal have become valuable commodities, even resulting in theft in some cases, there has also been a greater demand for PET plastics and other formerly valueless commodities. Different non-traditional areas of recycling growth have become more prominent. Organic recycling and E-waste were two areas that were most talked about this year and will continue to grow as residences and businesses figure out what to do with leftover food waste as well as electronics that cannot be disposed of in traditional methods. "E-waste is the one thing that has really stood out this year in moving the industry forward. It is totally different in this industry," says Tagliavia. "New York has opened its first E-waste recycling center operated by a private company and they are going to start taking on e-waste. I believe it is going to be a big part of the industry because it's a way to dispose of computers, TVs, anything electronic, etc."

Converting Vehicles to CNG

While the area of recycling saw tremendous growth in 2012, more companies tried out CNG vehicles or considered the transition. Those haulers that were interested but could not afford the cost of a whole new truck, experimented with rebodied trucks and diesel engines in order to avoid buying brand new as well as EPA requirements that increase the truck cost while reducing truck engine reliability. Some do believe that converting to CNG is worth the cost, especially since the price of diesel has gone up while the natural gas price per diesel gallon equivalent has come down. Says Weil, "CNG has proven thus far to be a savings over diesel depending on how you depreciate the vehicle's additional $35,000 to $45,000 cost. I believe larger fleets will greatly help in normalizing the cost of the equipment and the infrastructure required." "However, in some places there is no infrastructure in place to refuel trucks. Ultimately, it would cost more to drive the trucks since they would have to drive a longer distance in order to refuel. In some of these cases, like New York City, they have been taking advantage of newer technologies that allow trucks to get better gas mileage. "Here in New York City, diesel engines are running unbelievably well and they are getting better gas mileage since technology has been very advanced with the new DES, etc.," says Tagliavia. It will be interesting to see how what kind of progress CNG will have in the next year or two and whether hauling companies who are considering the change will decide that it is worth the investment in their area.

Safety

Earlier this year, the Bureau of Labor Statistics released some troubling information about the waste industry being the 4th most dangerous job in the country. While companies are going to great lengths to educate their employees, there are still some issues that need to be dealt with in the industry. Says Wallace, "Safety is always a huge issue in the solid waste industry depending largely on the type of collection line of business—roll-off, front load and residential two- and three-man routes can lead to lots of challenges. Sometimes everyone is in a rush and impatient; this leads to accidents." Weil agrees, "Unfortunately, I believe we are still in the curve for equipment meeting up with the safest collection methods. Old style rear-end collection still puts collection personal in harm's way in the lanes of traffic between approaching motorists and the collection vehicle. This is an equation that leads to disaster daily. Through more modern collection vehicles like automation, you reduce the number of personnel, exposure to the roadway, fatigue, and a long list of other items, like morale, that you can't necessarily calculate the cost of. It is still evolving." He points out that another issue is economics. "The push for productivity has a great cost that haulers in an effort to remain competitive need to realize where those stats meet. There is a large price to pay for high productivity (safety)."

An alternative opinion to this scenario is that rather than constantly re-educating employees who are well-trained in what to do and what not to do, is to concentrate on educating the public about the dangers of the trash truck. "You have to continuously train drivers and employees, but I also think we have to educate the population on how dangerous garbage trucks are," says Tagliavia. "The biggest issues that vehicles have had in New York City is people running into garbage trucks or being injured by garbage trucks because they are standing too close to the curb—they don't want to move out of the way, they are busy texting and listening to their ipods, or using their ipads and not paying attention to their surroundings. You are always going to have issues when you are picking up refuse, but I think if you eliminate pedestrians taking that for granted that they can outrun a garbage truck or stand too close to the truck when it is trying to make a turn, you may see that the garbage industry is not as bad as they say it is." So, instead of concentrating on just educating employees, Tagliavia believes that ordinary citizens need to be taught to be aware of their surroundings and that trash trucks can be dangerous by using visual aids—commercials, billboards, print ads, etc.

2013 Outlook

While the recycling industry has seen significant growth and the waste industry is in transition, waste conversion is an area that is still on the horizon with Waste-to-Energy as the first "popular" technology. Although, it is being talked about more as a real possibility at trade shows and conference, only a portion of larger companies and municipalities, like the City of Los Angeles, remain able to foot the cost of implementing this next step of waste diversion.

Another issue to watch is flow control. We have all seen the news about this concept being taken to court in some States saying it violates State and Federal constitutions, while others believe that it levels the playing field between the big players and the smaller haulers. Says Tagliavia, "People in the industry are either seriously for or against it. The pro is that the national companies compared to the smaller hauling companies have to dump everything at a particular location where everyone is going to have the same tipping fees so the competition is at the same level. However, if you are a company that owns a transfer station, you can't bring your garbage to it. This is something that will be an ongoing issue and fought in courts. It's going to be a long battle."

Positive Changes

As smaller companies continue to work on leveling the playing field with regards to the bigger players, those who will continue to survive and grow will see some positive changes in the industry. "Next year, there will be continued diversification, improvement in recycling commodity recovery and waste diversion," says Wallace. "For example, in 2020, the State of California increases its mandatory waste diversion or recycling rate to 75 percent and I expect other states will begin to follow suit." Whatever changes may come in 2013, there will be many things to watch as the waste and recycling industries transition to the next phase in all areas. It will be interesting to see how it all plays out; only time will tell. | WA

Funding

Get Educated About the Grant Funding Process Before You Apply

Sarah Aubrey

> **Educating yourself about the grant funding process will IMPROVE YOUR LIKELIHOOD OF USING GRANTS AS A FINANCIAL TOOL for waste and environmental projects.**

AN UNPRECEDENTED NUMBER OF GRANTS ARE NOW available for entrepreneurs, communities, technology developers and implementers, agricultural producers, municipalities and small businesses in the areas of waste management and recycling. Funds can be used for new projects, upgrades to old systems and for value-added ventures. According to www.grants.gov, the federal government's grant search engine, there are more than 26 agencies offering dollars from more than 900 grant programs each year. Not counting the stimulus funds of 2009, 2010 and 2011, the feds have awarded more than $350 billion each year in grants. Funding sources are not just governmental. The waste management realm is of interest to trade groups and corporate foundations as well. Social responsibility giving—including giving to foundations that support the causes, new products, services and industries the giver cares about—is on the rise. Foundation giving makes up almost 2 percent of our GDP (gross domestic product), according to the "Chronicle of Philanthropy", an article published recently in The Wall Street Journal. The Center for Philanthropy at Indiana University goes even farther saying that contributions to social causes amounts to $732 per person in America today. Not all of this money is for 'charity' per se—as much as 25 percent is used to fund grant programs.

Of course, the common lament is that funding levels are getting tighter and the competition stronger as the industry grows and more players get in. Knowing where to find the funds, how to apply for them and how to produce quality proposals that get the needed dollars takes expertise and contacts. Most industry players have the experience and contacts; however, if grant success is elusive, they may be overlooking an understanding of the entire grant process. In her book *Demystifying Grant Seeking*, the author, Judith E. Nichols, notes: "Grant seeking relies more on knowing what to do than how to write."

As a grant writer in this industry for six years, I concur. Preparedness and planning are the missing links in securing grant funds in a competitive environment. 'If you fail to plan, you plan to fail', goes the adage. Never has this been more accurate than in the case of grant funding today. Educating yourself about grant funding is unique because applications require so much documentation and agencies vary. The average size of federal application that leaves our office is more than 250 pages and many exceed 600. That is a lot of work, organizing and planning! To mount a strong grant writing case, it boils down to five key areas that many would-be successful applicants fail to implement well in advance of the grant application:

1. Community acceptance planning
2. Technical feasibility assessments completed by a third party
3. Permitting and zoning ready
4. Partnerships identified and formed
5. Timeline that is doable

Public Relations and Community Acceptance

The number one area that often gets overlooked is public relations (PR). No, you don't need a PR plan as an attachment to your next grant application. But, you will need to show a great deal of documentation indicating that your project can or is moving forward; much of that material is only accessible if local officials approve your requests for zoning changes, site development and permitting. Jay Catasein of Twisted Oak Corporation (Atlanta, GA), biomass-to-energy developers, says a successful project is akin to a three-legged stool. "One of those legs is community acceptance accomplished through savvy public relations. Many projects fail because this element of planning is relegated to the end of development."

Focused on sound technical merit and dollars, many developers don't take time to avoid major PR mistakes such these top six:

1. Not considering PR part of the project business plan
2. Initiating local PR only after opposition is present
3. Appearing too secretive in the name of protecting proprietary information
4. Involving only the developer's preferred political party in the process

5. Not involving media on a proactive basis
6. Relying only on consultants causing too little developer involvement in the local area

Catasein says technical merit and sound financials are the first two legs in the stool, but without public acceptance, the stool is likely to topple over. "The nation is now littered with failed development of good, technically sound projects undertaken by developers who ignored the importance of local opinion early in the process. Many developers fail to initiate community acceptance strategies until strong opposition has organized to defeat the well-intentioned efforts of the developer," he points out.

Grant writing tip*: You're going to need those relationships later when support letters are required for some grants. Better to not only have forged the relationships early on than to have to repair later.*

Technical and Feasibility

All projects moving toward implementation will have assessed technology and feasibility. However, as a grant writer, I often run into material that meets the developer's standards, but not those of the grant agency. One possible roadblock is often found in how the feasibility study is prepared. For many of its grant programs, USDA (United States Department of Agriculture) requires that feasibility studies be included and that they be completed by an independent consultant. Straight from the regulations found at www.rurdev.usda.gov/SupportDocuments/OR-BIfeasibility.pdf, here is the description of a qualified consultant: "The study must be prepared by an independent, qualified consultant with a recognized expertise in the type of operation being analyzed. The analyst cannot be 'in-house', a firm with a proprietary interest in the project, a vendor or any other party with a potential conflict of interest or vested interest in the outcome of the study."

The study is further evaluated by USDA's five-part test to check for the inclusion of the following major components, also detailed at the Web site above:

1. Economic
2. Market
3. Technical
4. Financial
5. Management

Grant writing tip*: Project developers should make themselves familiar with similar guidelines from other agencies to receive maximum application points.*

Permitting, Zoning

Much like technology and feasibility, project planners know that zoning and permitting are part of the implementation plan. However, more than one project has been tripped up by not initiating these processes quick enough to meet grant documentation requirements. "The community zoning board will be most interested in knowing where a project is proposed, what the project is, what it does, how it (basically) works, any potential environmental impacts, and any zoning considerations and how a change in project site zoning could affect their own property," says Mike Dunn, Initiative Director with the Indiana Soybean Alliance (Indianapolis, IN). Dunn knows zoning and

Figure 1: 30-Day Grant Planning Process. Image courtesy of Prosperity AG.

permitting having worked at the Indiana environmental management agency (IDEM) for 11 years dealing with permitting especially for waste management. "Beyond the local level, most projects will be subject to a state permitting action that exposes the very detailed project plans for a public review during the permitting process. The state does have a proprietary protection option for any and all applicants seeking a permit to protect sensitive materials," he adds. Grant applications for any technical project will want to see permit, zoning and site concerns addressed. Even if the timeline for obtaining these is in the future, if a grant is due and indicates that documentation is required, points are deducted if there is not an adequate response.

Grant writing tip*: At the very least, research and then name those permits required at every stage of the project and propose a timeline for obtaining.*

Partnerships Ready to Go

There are times when you can go it alone and times, like in the case of large federal grant applications, when more than one entity makes a stronger showing. Crafting partnership arrangements for research, implementation or just to showcase the project in the community is important for many grants. One great example is to partner with academia. Chad Martin, Renewable Energy Extension Specialist with Purdue University has worked with a variety of entities to move the industry forward. "Establishing relationships with university faculty researchers can open doors for many entrepreneurs when attracting funds for creating innovative and new ideas," he explains. Partnerships show a level of responsibility on the part of the applicant and also show that others in the industry, especially those carrying the heft of a major university, see merit in the project. "These alliances often add credibility to a project when reviewers score your proposal," Martin points out.

Finally, universities have free and low cost benefits and are built on knowledge capture and dissemination. Using well-documented, third-party information as a basis for a grant application is a sound tactic. "Many have also uncovered untapped resources which may be available to mutually benefit your project and the mission of a research institution," Martin adds.

Grant writing tip*: Partnerships are often required to be formally established through documentation like Letters of Intent, Memorandums of Understanding, or even* *legal entity formation like an LLC. Because these take time, if you are looking at grant funding, be certain these are on your pre-application to do list.*

Timeline

The final piece in planning for a successful grant funding program is putting it all together in a timeline that is doable. Every solid project manager has his or her own system that works best. As a grant writer, I recognize that not every project has the luxury of time, but the rate of success goes up as the strategy and attention to detail get more consideration. **Figure** 1 shows a sample 30-day grant planning process. The process should be modified to fit the particular situation and grant as well as the size of the team and the agency's guidelines. For example, an entrepreneur might be able to make adjustments and write content all the way up until the 'submit' button is hit, but a project within a university will have channels to swim through before the application leaves the premises. With that in mind, mold the process to fit the organizational structure.

Grant writing tip*: Be certain to build an accurate timeline for your project's completion. Grant applications will require this as well as a work plan indicating who will own each major task.*

Concluding Thoughts on Grant Funding

Education about the grant funding process will improve the likelihood of using grants as a financial tool for waste and environmental projects. The previous list is not exhaustive: every grant agency and every grant program during every fiscal year is unique. So, if the developer intends to use grant funding, a solid investment in time and training about common requirements from their funder of choice is an investment that pays back. | **WA**

Sarah Aubrey *is the owner of Prosperity Ag and Energy Resources (Monrovia, IN), a full-service funding opportunities firm that aids entrepreneurs, communities, universities, trade associations and cooperatives in obtaining funds through the use of government or foundation programs in the areas of agriculture, energy, environment and food manufacturing. As a Certified Grant Administrator, Sarah aids clients in networking with state and federal agencies and trade groups to foster all areas of project development. Since 2007, Sarah has written more than 400 successful grants in 33 states; funding for these awards has yielded nearly $50 million. She can be reached at (317) 996-2777 or e-mail sarah@prosperityagenergy.com. Follow Prosperity AG on twitter, linkedin, facebook, blogspot and sign up for a free monthly newsletter with grant listing and project success stories at www.prosperityagenergy.com.*

Selected Waste Management and Recycling Grants

Below is a short list of possible waste management and recycling grants. Be sure to also check your state's energy and environmental departments and consider corporate foundations.

USDA Solid Waste Management Grant Program
www.rurdev.usda.gov/UWP-solidwastemanagement.htm

USDA Water and Waste Disposal Direct Loans and Grants
www.rurdev.usda.gov/UWP-dispdirectloansgrants.htm

NSF Environmental Engineering
www.nsf.gov/funding/pgm_summ.jsp?pims_id=501029

NSF Environmental Sustainability
www.nsf.gov/funding/pgm_summ.jsp?pims_id=501027

Conservation Innovation Grants (under EQIP)
www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/cig

EPA Brownfields Assessment, Revolving Loan Fund, and Cleanup (ARC) Grant
www.epa.gov/brownfields/applicat.htm

EPA Water Quality Management Planning Grants
www.epa.gov/region4/water/gtas/grantprograms.html#management

Safety

A Simple, Underused Tool That Can Transform Your Safety Culture

Dr. Mike Williamsen, Ph.D., CSP

If you want something different, you will have to DO SOMETHING DIFFERENT. Organizations that have implemented a recognition system have helped transform their safety culture to a healthier level well beyond their previous reality.

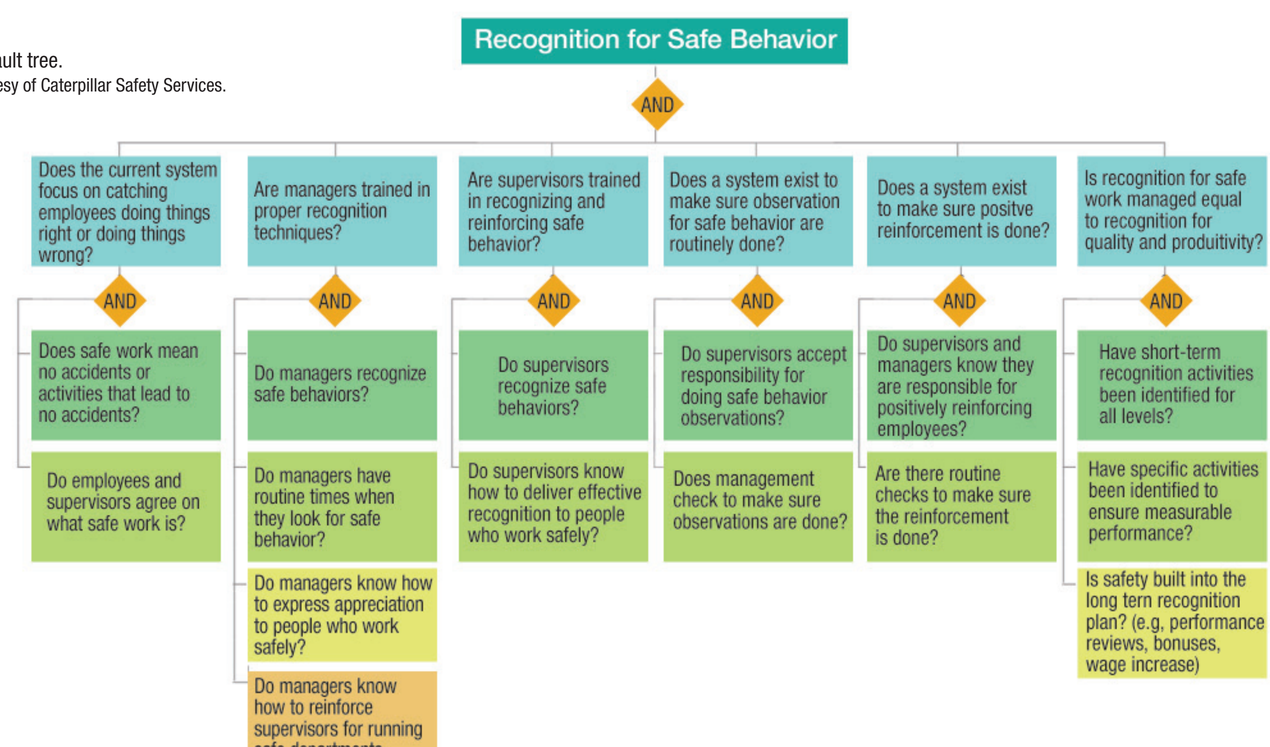
RECOGNITION FOR DOING THINGS CORRECTLY seems to be a lost art. Over the years, I have assessed perception surveys for hundreds of organizations and tens of thousands of employees. As I tally the results, recognition for performance of doing things right is the lowest scoring safety management process. Interestingly, discipline (i.e., correcting people when they do something wrong) scores as the sixth lowest of the 21 safety management processes.[1] So whether employees do the job right or wrong, they are pretty much left alone to figure out what they ought to do.

Indeed, improving recognition skills is one of the best methods for an organization to improve the way its employees communicate the important safety messages which help prevent injuries. During the development of the safety perception survey, there was an extensive effort to find a few questions that would audit the reality of a safety recognition culture in the workplace. The questions that were developed as the benchmarks are:

- Is promotion to higher-level jobs dependent on good safety performance?
- Is safe work behavior recognized by supervisors?
- Are safe workers picked to train new employees?
- Can first-line supervisors reward employees for good safety performance?
- Is safe work behavior recognized by your company?

Armed with data from hourly, supervision and management employees who take the survey, a continuous improvement team made up of people from the front line and management meets to develop a process solution. Their charge is to develop their own recognition system based on safety accountabilities that are practiced every day across the organization.

Figure 1: Fault tree.
Figures courtesy of Caterpillar Safety Services.



RECOGNITION EFFECTIVE RECOGNITION HAS FIVE CHARACTERISTICS:

TIMELY:
✓ When you see it, you say it
✓ Relevant to the work being performed
✓ Sincere
✓ Confirmed by the person being given feedback
✓ Frequent

BENEFITS ARE:
✓ Increased confidence
✓ Increased creativity in problem solving
✓ Increased engagement in problem solving
✓ Increased interactivity in work process
✓ Positive overall attitudes
✓ Better team morale
✓ Improved safety culture
✓ Zero injuries

Team: Mike, Ann, Gray, Brad, Karisa, Shel			Date: 3-23-11	
Item	Action Item/Task	Who	Target	Comments
1	Review the provided Fault Tree Diagram for recognizing safe behavior and recommend any changes	SR	Complete	Reviewed Fault Tree diagram and identified shortcomings – implemented into June 3-28 action items
2	Develop audit of new process after 6 months at the pilot site(s)	KM BC AC	Complete	Based on the list of audit questions developed. Include in report
3	Determine what training is required for the pilot group	Team	GF/WD	Refine for inclusion in the final report
4	Deliver an approach that is applicable to employees in safety sensitive positions	N/A	4-7	On completion of the final report
5	Present Policy Statement, Charter and POP Statement to the Steering Team Committee	GM	Complete	

Figure 2: Action item matrix.

Adopt A Coaching Culture

A common thread is that we have not trained our people well in the basics of human interaction. The symptom here is that we are not very effective in giving and receiving feedback on job performance, whether it is in safety, quality or production. A typical part of the team solution is to train all the personnel in giving and receiving feedback, and how to be effective in providing one-on-one recognition for doing a job well. The associated training and role play goes a long way to beginning a new culture of asking for permission to have the safety conversation, getting a commitment to live safe behaviors and following up in an adult manner.

In turn, this launches a coaching culture in which hourly and salaried personnel try to catch people doing things correctly. All too often, safety pros, supervision and management concentrate on what is wrong with little or no positive feedback for the overwhelming number of times all is well with safety. The end result is our people know more about what we don't want than what we do want.

Think back to your coaching experiences, either as a player or as a coach. The effective coach watches what is going on and then intercedes where improvement is needed. This interaction is not punitive, but adult in nature. The player is shown what is correct and then demonstrates this back to the coach until both are satisfied that the basic skills are in place. The coach then continues to observe and give positive feedback as the player demonstrates the correct skill. This approach includes:

- A one-on-one event focused on what is correct
- A commitment from the student to do the task correctly
- A continual one-on-one follow-up on the skill in question
- An adult approach to improving performance
- A simple model that is used to teach new skills:
  1. Define what needs to be done correctly
  2. Train correctly
  3. Measure how well the skill is performed
  4. Give feedback on trainee performance

This approach is effective human interaction 101, but is seldom practiced in most safety cultures. Once the organization realizes the what, how, when and who, they almost always launch a successful initiative which significantly improves not only their overall safety culture, but other cultures within the company (i.e. cost, quality, customer service, etc.) as well.

Prepare an Improvement Plan

So let's go back to the continuous improvement team that takes these fundamentals and develops an effective safety recognition culture. Start the team with a POP statement: Purpose, Outcomes, Process.

Purpose

Develop and deliver a positive and meaningful safety recognition approach that becomes the company's way of life and improves safety performance in all that is done.

Outcomes (Deliverables)

- Each manager and supervisor positively recognizes an employee daily
- Each meeting starts with recognition of one positive employee action
- Rush orders/production do not violate safety procedures
- Employees do not perform unsafe acts
- Managers and supervisors never require an employee to work unsafely
- People are trained in the new system
- Work on extinguishing actions that do not fit this new culture

Process (By Which this Will be Accomplished)

Through a one-week rapid improvement workshop, the team identifies key process changes, and delivers the final product to management for review. The new safety recognition system is then piloted in a work group before being rolled out to the rest of the organization. The team also uses a fault tree diagram to understand the basics of providing effective safety recognition/feedback (**see Figure 1, page xx**). As the team reviews each block in the fault tree, it develops action items through which team members execute the development of the new system. A condensed example of this is given in **Figure 2**, page xx. As the team does its development work, members go to the field and ask open-ended questions to find out what the front-line employees think would be effective recognition. Two examples of this are:

1. "How should employees be recognized for safety? What works and doesn't work?"
2. "If you were in charge of safety, what would you do differently?"

A consistent reply from employees is along the lines of *"Positive recognition is the most significant step our organization can take toward improved safety performance."*

Refine for Greater Rewards

Once the pilot test of the new recognition system is up and running, team members audit the process by asking open-ended questions of the pilot participants. Typical questions are:

- What to do you think about the "See It, Say It, Live It" positive safety recognition approach? (i.e., frequent, timely, face-to-face engagement, sincere and focused on job content with confirmation)
- Can you think of a time when you gave positive safety recognition and it went very well? What factors contributed to this experience?

The teams often come up with two types of recognition:

- Planned: Quarterly and annual reviews
- Immediate Recognition

Both are important, and when in the field, management must:

- See It – Say It – Live It
- Look for opportunities to provide immediate recognition

Time and again, organizations have found that immediate recognition provides the strongest reinforcement (**see Recognition sidebar, page 30**).

This may seem to be a very detailed approach to move your current culture to one of frequent positive recognition for jobs done well. In fact, this is true. If you want something different, you will have to do something different. Organizations that have implemented such a system have truly made positive recognition a part of their safety culture and involve all employees in the new process. In so doing, they have helped transform their safety culture to a healthier level well beyond their previous reality. | **WA**

***Dr. Mike Williamsen**, Ph.D., CSP is a Senior Safety Consultant with Caterpillar Safety Services. To reach Mike, or for more information about positive safety recognition, Rapid Improvement Workshops, or training programs to enhance communication about safety, e-mail SafetyServices@cat.com.*

Note

1. As measured by the Caterpillar Safety Services statistically validated survey.

Third of Four Parts

Troubleshooting PTO Installation: Working Through the Bugs

Mikel Janitz

> **Troubleshooting is a bit of an art and REQUIRES PATIENCE, SPECIFIC PRODUCT KNOWLEDGE AND GOOD TOOLS. If the PTO is not working as planned, simply step back and review the problem.**

THIS ARTICLE IS THIRD IN A SERIES TO HELP owners and end users plan the selection, installation and maintenance of vehicles equipped with power take-offs, extended shafts and hydraulic equipment related to mobile power. These articles cover the important and oftentimes forgotten topics mechanics need to be familiar with in order to get the most out of their power take-off (PTO).

Troubleshooting a PTO's performance, or that of any other mobile power system, requires focus, planning and system knowledge; it is essential to keep that in mind as you approach the process. The two main troubleshooting areas are mechanical and electrical. The mechanical aspect has a few key areas of concern. Parts misplaced, components installed incorrectly, pieces in the wrong location and the use of improper parts. Electrical issues may include wrong or omitted parts, bad connections and/or poor grounding. Typically, there should not be any new parts left in the box or on the shop floor after the installation is completed and it is vital that the installer reads the instructions. One last major area deals with hydraulics and pneumatics and their relationship to electrical and mechanical functionality; these areas are touched on last. Remember to contact your distributor or call the PTO manufacturer to help with questions or troubleshoot if you need any assistance.

Where Do You Need to Start?

Focus on the mechanical and electrical aspect as they relate to and interact with the hydraulics and pneumatics circuits—essentially look at the system as a whole **(see Figure 1)**. Study the system drawings or schematics and think through the system in order to decide on the best course of action. Make a plan and work it. Although it may seem obvious, make sure the vehicle engine is off and the equipment has had time to cool down before working around or under any vehicle. Working near rotating parts is extremely dangerous so be sure to use safe practices before beginning any work

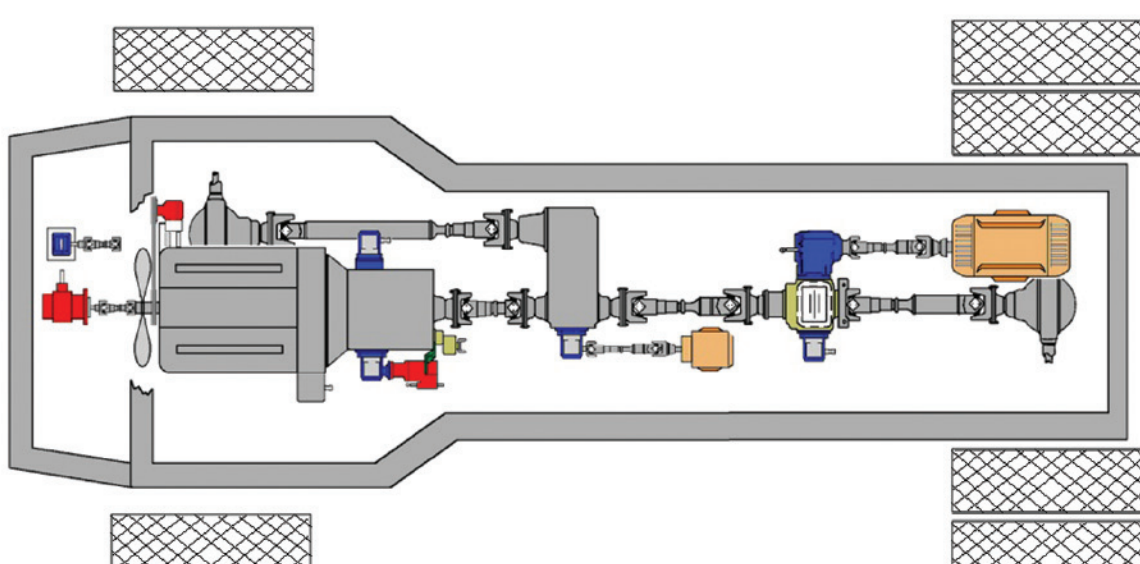


Figure 1
A top down section view. It shows multiple examples of PTO applications on a vehicle with mobile power needs.

Images courtesy of Muncie Power Products.

Figure 2
An example of an indicator switch. This is an under-the-dash PTO rocker switch with the indicator light illuminating.

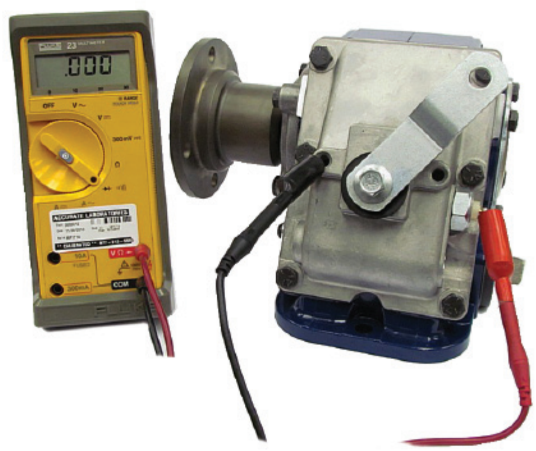


Figure 3
A typical test set up with a volt meter attached to the PTO. Remember to use a calibrated meter to ensure the most accurate results.

underneath the vehicle. Chock the wheels, remove the keys and be sure to put them in a safe place before applying lockout tags. Adhere to all safety warnings and precautions.

Mechanical

The first course of action is to study the system from start to finish. This works for mechanical, electrical or hydraulic debugging: a technique known as the divide and conquer method. First, focus on the mechanical side. Identify what is not working; for example, is the auxiliary equipment not rotating, not building pressure, leaking or is there simply just no flow? Start at the end of the system and work your way back toward the PTO. You may find that the problem is not even with the PTO to begin with. Look for something or anything that could be missing. Do the splines match? Are the splines engaged? Check to see if the woodruff key is missing from the output shaft. Are all the fasteners in place and tight? Verify that the extend shaft is installed in the housing. If it is a cable shift, confirm that the shift lever moves enough to properly engage the gears. If it is an electric shift, make sure the wires are connected. If it is air shift, confirm that there is a minimum of 65 psi of air pressure. Determine if the input gear is meshing with the transmission gear. Most PTOs have an indicator light mounted on a bracket in the cab—be sure to check to make sure it is connected and functional. If all of the PTO mechanical components are accounted for and properly installed, then is time to focus on the electrical side **(see Figure 2)**.

Electrical

Electrical troubleshooting follows the same divide and conquer method. Again, make sure the engine is off and there are no rotating components. Start at the furthest end of the system and check electrical connections. Work your way back toward the PTO.

Are components showing any signs of cracks or defects from installation? Is there anything leaking? If bad parts are discovered, replace them with new parts from the manufacturer. Do not substitute used parts. That practice is problematic and extremely difficult to ensure reliability. Next, trace the wire routing and remove or fix any kinks or pinched wires because these may cause grounding. Make sure wires do not touch the exhaust pipes. Wires that are too close to a heat source can melt and ground out components. Also, inspect each connection to ensure there is adequate contact. Use a continuity meter to verify routings and ground issues (**see Figure 3**).

If wires were crimped, make sure the insulation on the wire is removed and the terminal is connected firmly to bare wire. Poor connections can become hot spots later and are more susceptible to corrosion. Step back and take a minute to review the system and the schematic. Verify you have all switches, sensors and other electrical parts in place. Confirm that they are secure in their location and check to see if the wires are crossed. Verify connections are not loose or disconnected altogether. Omitting parts, poor connections, jumping wires and using inferior substitutes will reduce your PTO performance. You will then find yourself back under the vehicle fixing what you should have done right the first time. Another important point to mention is PTO integration with the engine control module (ECM). Vehicles are becoming more sophisticated and it is vital that the PTO is properly "plugged in" to the vehicle. Check the connection and wire routing and, as always, be sure to review the supplied schematic that comes with the PTO (**see Figure 4**).

Hydraulic and Pneumatic System

It is extremely important to review the hydraulic and pneumatic system layout and diagram. Troubleshooting their circuitry, fittings, line orientation and their interaction with the mechanical and electrical system is essential to trouble-free operation. Again, use the divide and conquer technique. Isolate components and test where possible, one at a time. Verify that proper fittings and hoses are used and look for pinched or restricted hose lines. Use the correct size of hose for the

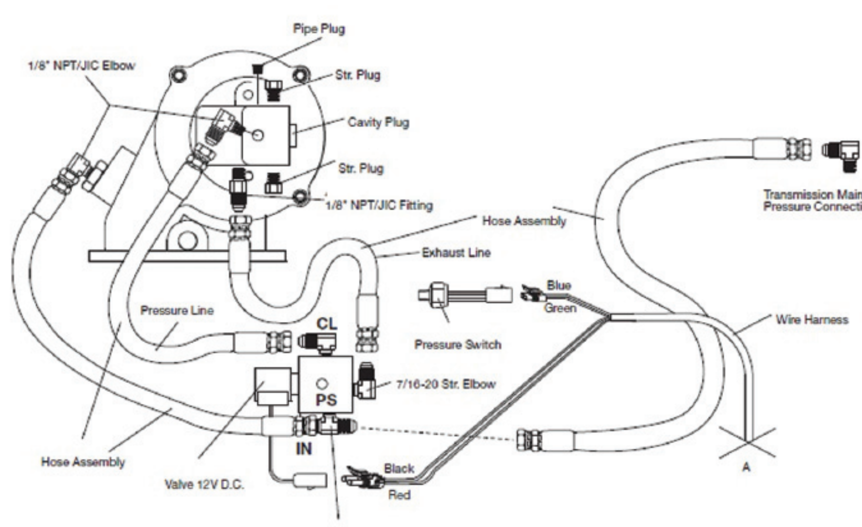


Figure 4: Here is an electrical depiction. Electrical wire installation and troubleshooting can be simplified by following and using the supplied schematic. These are typically found in the PTO owner's manual.

application. Hose routing is important; they must be secure and kept away from any/all heat sources. If you use zip ties, do not over tighten them because that can restrict flow as well. Keep them as straight as possible, and when routing requires bending, create a large radius.

Hydraulic systems require an adequate supply of fluid so be sure you have added enough fluid to fill the system and replenish any fluids that may have been spilled during installation. Make sure inlet lines are not crossed with outlet ports and vice versa and check the hydraulic/ pneumatic schematic. Verify connections are tight and not leaking and do not use Teflon tape with National Pipe Thread (NPT) fittings; remove any tape if found. Tape always seems to find its way into the fluid and can disrupt flow while causing damage to internal parts **(see Figure 5)**.

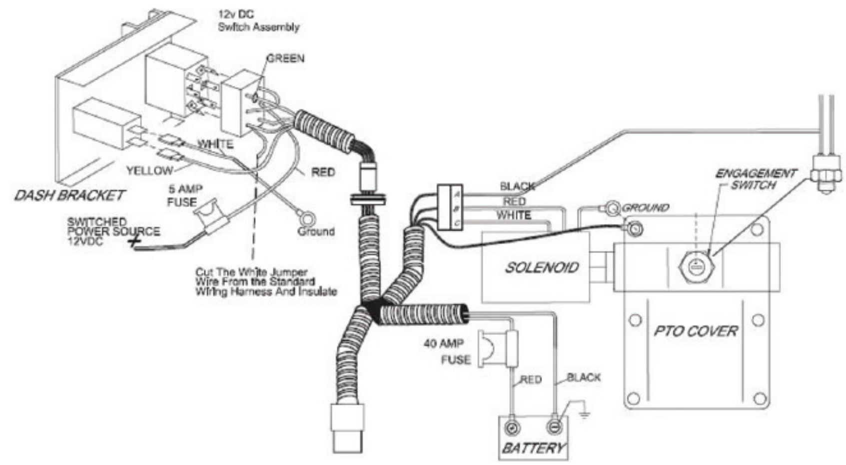


Figure 5: Here is a hydraulic depiction. Hydraulics systems can be very complicated to install. This is a simplified depiction with clearly identified parts to help with the installation and troubleshooting.

Troubleshooting as an Art

Troubleshooting is a bit of an art and requires patience, specific product knowledge and good tools. If the PTO is not working as planned, simply step back and review the problem. Think about the mechanical, electrical and/or hydraulic and pneumatic features. Look around for extra parts on the floor or in the box. Divide and conquer to isolate parts to better evaluate performance. Test and verify functionality whenever possible and use continuity meters, volt meters and gauges to quantify readings; you cannot just assume anything. Swap component parts with factory parts to identify bad parts and do not use old parts just to save money because it will cost you more money in the long run. The optimum PTO can be specified. The installation can be exacting; unfortunately, the unexpected happens and troubleshooting performance is sometimes required to get the job done right. | WA

The final article in this series covers critical PTO maintenance topics.

***Mikel Janitz** is the Manager of Engineering for Muncie Power Products (Muncie, IN). He can be reached at mjanitz@munciepower.com or visit www.munciepower.com.*

An Organizing Approach for Entitling Waste Projects

Jay Vincent

Identify, engage, harness, mobilize.

WITH NEARLY FOUR OUT OF FIVE AMERICANS OPPOSING ANY type of development in their community, it is not a stretch to think that different types of development would get different types of reactions from neighbors and stakeholders. The annual Saint Index survey of public attitudes about land use and development illustrates that those uses that are more industrial in nature will be more intensely opposed; whether it is a landfill or manufacturing facility, the more the use, the more intense the opposition.

Statistics are further borne out in the media where we see articles describing the difficulties private and public entities have entitling new waste treatment facilities, transfer stations and the like. As far as permitting new projects, this is the new normal. Public participation is on the rise and in too many cases the non-applicant participants are led by the opposition. Without an infusion of supportive voices that understand the benefits and are vested in the outcome of the projects, plans across the board could be delayed or defeated.

Advocacy Pyramid

Mobilizing grassroots advocates is necessary when navigating the process of permitting your project. Outreach is essential whether you are a public or a private entity. When considering approaches to outreach, it is key that you choose an approach that allows for fluidity in the face of a constantly changing public narrative.

Ensure that the approach prescribes a process driven approach instead of a procedural driven one. Viewing outreach through the lens of a procedural approach will create a series of discreet steps but ignores the fact that there is a system in place that is dynamic and fluid itself. Instead, view outreach as a whole—a process or a series of procedures with the end goal to transform identified supporters into vocal advocates for your project.

One approach to building public support is called the Advocacy Pyramid. Think of it as a way to categorize people through a process. It assumes that every identified stakeholder has a right to share their opinion on the project at hand and to be educated by the applicant or developer of the project. The burden of education is on the applicant because the opposition will surely spend its time educating and setting the table of "facts".

The approach also focuses on ensuring that along the way of advancing an authentic outreach engagement, you can harness and mobilize vocal advocates. Their participation in the process is absolutely necessary. The advocacy pyramid is simple approach to help you illustrate public support for even the most controversial projects. Think of it as a process not a procedure. It is all about action and seizing the moment. Remember, the outcome you are looking for is political action from vocal advocates.

Identify

Identify all of the stakeholders you know and might expect to participate in the hearings or permitting process. Why? Because the law mandates that you should know some of them and the rest of the stakeholders expect us to. It is the right thing to do. Create a stakeholder map that identifies all of those people reasonably expected to participate in the process. Once identified, map and rank them so you know how to engage. Always remember that throughout the overall process, this step of identification is ongoing as the core piece of information that drives the process is: "Where does she stand on the project?"

Engage

Start with the position that you are going to meet with those who deserve to participate in the process and have some sort of stake—whether it is safe streets, an investment or a property right. No longer can either a public or a private entity shirk its role as the prime mover to educate the community. Without engaging the community, one starts from a losing position within this new normal.

Harness

Undoubtedly, when developing a stakeholder map you will see that the opposition or watchdog infrastructure is more robust. This means that you will need to build support infrastructure for a formal group of stakeholders to support you. Do not be shy about asking community supporters to form a group and advocate for the project publicly.

Mobilize

Mentioned earlier is this concept of a passion gap. Where it exists, the stakeholder on the supporter side needs more attention to take an action. Remember, mobilizing grassroots advocates is absolutely necessary in today's permitting environment and should be a key part of your strategy. The precursor to a supporter taking political action is constant engagement and communication by the applicant—to identify supporters and transform them into vocal advocates.

Be Proactive

To succeed in today's permitting climate, identify who your neighbors will be and engage with them about your projects before the opposition sets the table. Where you find support, you must harness and mobilize it in support of your position. Those who work tirelessly to kill your project are using a similar approach and their own set of tactics. It is time that you approached the process in a similar way because when residents are educated first, it cuts off the ability of the opposition to use deceit to attract stakeholders to their position. Be the prime educator. The rewards will be real and you will hear at the doors: "Thank you for taking the time to listen to my viewpoint." | WA

Jay Vincent is senior vice president of business development and manages the Waste and Recycling Practices for The Saint Consulting Group (Hingham, MA), a land use political consultancy with offices in the U.S., Canada and UK. He can be reached at Vincent@tscg.biz.


BWE
BAKERS WASTE EQUIPMENT
Your Source for Innovative Equipment
And Waste Stream Solutions
Happy Holidays From Our Family to Yours
Full Line of
Front Load Containers
Waste Compactors With
Customized Load Options
Roll-Off Containers
Built for Standard &
Special Applications
Specialized Containers
For Recycling Collection
Exceptional Customer Service, Quality Products,
At A Competitive Price For Over 30 Years!
CLICK HERE FOR MORE INFORMATION!
1-800-221-4153
www.BWE-NC.com

OT5: What It Is, Why It's Important

Darell Luther

> **If you're in the waste business, PAY PARTICULAR ATTENTION TO THE OT5 REQUIREMENTS, especially the ability to store railcars when you're not using them.**

IT TAKES A VERY LARGE NUMBER AND DIFFERENT types of railcars to keep rail shippers commerce flowing every day on North American Railroads. Eight main types of freight railcars make up the consolidated 1.5 million railcars in service. Of these 1.5 million railcars approximately 1.31 million of them are in revenue freight service in the U.S, the balance being in Canada and Mexico freight service and in maintenance of way service. These 1.31 million railcars are responsible for approximately 1.85 billion tons of commodity shipments every year.

Railcars fall into one of two overall categories when classified by railroads, they are either railroad owned or controlled or privately owned **(see Table 1, page xx)**. Railroad owned or controlled railcars are either owned by the railroads or possibly a private investment company, but are running under a lease with the railroad and for operating purposes are controlled by the railroad whose marks are on the railcar. Railroad owned or controlled railcars are classified with the railroads reporting marks ending in a two to four letter designation (e.g. BNSF, UP, CSXT, NS) with a series of numbers that follow.

Private railcars, which account for approximately 65 percent of the total 1.5 million railcars in service, are owned by non-railroad entities and are classified as such carrying a four letter stencil ending in "X" (e.g. JOBX) with a series of numbers that follow. The large number of private railcars require a registration and approval process to ensure they meet the safety and mechanical requirements of the railroad on which they will be hauling freight. Additionally, if you desire to run your own Private Reporting Marks on your rail equipment, you will be required to fill out an AAR Interchange Agreement and pay the administrative fee for registration of the private reporting mark.

Private Railcars

The ability for a shipper or private railcar owner to run private railcars in service on any railroad in the U.S. is governed by a complex process as defined in the AAR Circular OT-5-J (OT5). The AAR publishes circulars for the purpose of communicating rules and regulations to railcar owners and users.

Circular OT5 has a number of requirements that are comprised of rules governing the assignment of reporting marks (private X marked railcars) and

Covers on 3,000 cube mill gondolas to haul radioactive waste

Photos courtesy of Tealinc.


HOW DOES BRIDGESTONE STACK UP IN TERMS OF RETREADABILITY?
#
FIRE DEPARTMENT VALVE
Fact: Bridgestone casings are #1 when it comes to retreadability. BASys data from over two million casings prove that Bridgestone had the lowest percentage of tires that could not be retreaded due to conditions related to casing construction. Lower than Michelin or Goodyear. And confirming what many have long suspected: A Bridgestone tire investment is a smarter tire investment. Get the facts at retreadinstead.com.
Precisely The Right Tire.

Height extension put on mill gondola to haul lightweight scrap.

Interior bracing modification to fit baled municipal solid waste bale size.

mechanical designations. OT5 is segregated into two primary classifications, those rules that apply to private tank cars and those that apply to private cars other than tank cars (see railcar type in Table 1).

Private Tank Cars

Using the AAR/UMLER fleet statistics as of January 2011, the private tank car fleet makes up 99.8 percent of the tank car fleet in operations today. That's a significant number of the overall tank car fleet and given the broad spectrum of commodities a tank car can transport, it's important to have a process that ensures the safe and efficient transport of these commodities. It's also significant to note that railroads do not hold themselves responsible to furnish tank cars to shippers and rarely is OT5 denied for tank cars provided the process is followed exactly as required.

That process for obtaining a railcar mark and approval to register tank cars is somewhat complex. Depending on where you are in the process the following compliance regulations are a requirement. Tank cars are regulated by several agencies and require a Certificate of Construction to be on file with the Bureau of Explosives and the Secretary AAR Technical Services showing compliance with Section 179.5 of the code of Federal Regulations. The good point is that railcar builders file these certificates as a matter of course on behalf of railcar buyers. If the railcar builders don't file the data, major leasing companies that own, or Lessees that manage tank cars, have the inherent knowledge required to file the correct documentation with the right agencies.

All applications involving secondhand cars must include certification by the buyer and/or seller of Form 88-Series that shows compliance with AAR Mechanical Rule 88 of the AAR Office Manual. If you're buying a tank car from a non-builder, be sure to require them to transfer the Form 88 – Series information. In today's environment, this is mostly done through electronic transfer to avoid the paper requirements. However, there are still a few holdouts requiring paper transfers that are still valid.

If you're running tank cars in service where the revenue move generates mileage earnings per Freight Tariff RPS6007-Series, the tank cars must be registered in the Universal Machine Language Equipment Register (UMLER). This data is then published in The Official Railway Equipment Register. Mileage earnings on tank cars are generally very limited to a few select commodities. The primary commodity shipped in tank cars still earning mileage is kaolin clay.

Private tank cars are assigned a mechanical designation differentiating the type of tank car design(s) and the general accepted commodities for that design. All private tank cars are assigned a mechanical designation of "T" when placed in service as new, rebuilt, secondhand or after modification.

Private Cars Other Than Tank Cars

The process of obtaining OT5 on private general service railcars (non-tank cars) is somewhat less complex than on tank cars. Given that there are still some 694,000 private railcars outside the tank car realm, the process is still important to ensure safe and efficient rail operations. Railroads not only require safe and efficient railcars on their lines through the use of the OT5 process, but also use OT5 to control the number of private railcars on their rail lines for purposes of controlling the number of railcars they handle for their commodities.

Railroads generally supply railcars that fit general service requirements and can be used across a wide array of commodities or are specific to long-term base load business. Specialty railcars within a classification or those that haul less than optimum capacity are types in which they tend not to invest.

The OT5 process for non-tank cars is similar to that of tank cars in that an applicant must still subscribe to the AAR Interchange Rules and properly maintain registration of reporting marks within UMLER. Form 88-series in

Freight Railcars by Type and Ownership/Control

Railcar Type	Ownership	Number of Railcars	% RR/PVT
Box Cars	RR	105,148	85.2%
	PVT	18,281	14.8%
Covered Hoppers	RR	136,206	29.7%
	PVT	322,429	70.3%
Open Hoppers	RR	74,768	42.3%
	PVT	102,081	57.7%
Gondolas	RR	127,906	52.9%
	PVT	113,673	47.1%
Flat Cars	RR	73,818	36.0%
	PVT	131,278	64.0%
Refrigerator	RR	13,413	81.0%
	PVT	3,148	19.0%
Tank Cars	RR	536	0.2%
	PVT	285,477	99.8%
All Others	RR	2,063	38.3%
	PVT	3,323	61.7%
Total	**RR**	**533,858**	**35.3%**
	PVT	**979,690**	**64.7%**

Source: AAR/UMLER-Fleet Stats as of January 2011

Table 1
Freight Railcars by Type and Ownership/Control.
Table courtesy of Tealinc (adapted from AAR Statistics).

paper or electronic form must be registered for the railcars being registered. Conversely, the OT5 process for non-tank cars is a bit different in that applicants should state the name of the owner or lessee, specific car numbers or series and the stations and industries at which the loads are intended to originate and the name of the originating line haul carrier. Applicants transmit the applications to the proposed originating carrier(s) who will subsequently notify the applicant of the approval or disapproval of the application. The carrier(s) cannot deny application approval for shipper-provided cars—except for reasons of safety, mechanical factors or inadequate storage space application approval does not commit the approving carrier(s) to use the applicants' cars. All applications must be submitted on Form OT-5.

After applications are approved, the owner or lessee may use the cars for the origination of traffic only at a specific station(s) and industry as defined in the OT5 form. If the owner or lessee desires to originate traffic at another station, an OT5 form needs to be filled out and approved for that station as well.

Interpreting the OT5 Requirements

OT5 requirements for tank cars are pretty complex in setting up but, from a railroad and shipper perspective, are necessary to ensure a railcar is constructed in such a manner to safely transport the commodity(s) for which it was built. Railroads don't compete with car owners, lessees and shippers to supply tank cars for freight service and, hence, are rarely denied for anything other than mechanical reasons.

OT5 requirements for general service freight cars are a somewhat different matter. The process is to ensure safe and efficient railroad operations. Safety is easy to interpret and there's clearly set rules and regulations that define it. However, efficiency is a different matter and is defined by a railroads need for a specific car type to satisfy its near term shipping requirements. The railroad's goal is to invest in mainstream commodity railcars or base load business railcars and leave the specialty railcars to be supplied through private owners. The waste business generally falls into the specialty railcar category rarely being supplied with railroad owned or controlled equipment and mostly being supported by private railcar owners. Consider that most railcars designed to haul waste have special characteristics such as weep holes being plugged on mill gondolas to haul dirty-dirt, height extensions on coal gondolas to increase the cubic capacity to haul construction and demolition debris, interior bracing removal and exterior side stake reinforcement on flat bottom gondolas to haul auto shredder fluff without being in the way of unloading machinery, single platform spine cars to reduce tare weight on flat cars to allow more container lading capacity, etc. If you're in the waste business, plan on supplying your own railcars. Pay particular attention to the OT5 requirements, especially the ability to store railcars when you're not using them. The number one OT5 denial reason is the lack of storage capacity for the private railcars being supplied. | WA

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

To request the information to register private reporting marks, e-mail private.marks@railinc.com. For complete forms or further direction, visit the AAR Web site at www.aar.org.


HEAVY DUTY PRODUCTS
WASTING THE COMPETITION!
HEAVY DUTY TRUCK RADIATORS
EXTREME DUTY CHARGE AIR COOLERS
"ANTI-CLOG" INDUSTRIAL CORE DESIGNS
COPPER A/C CONDENSERS (Repairable)
OVER 200 MODELS AVAILABLE!
RADIATOR WORKS
MACK MR/LE CHARGE AIR COOLERS
MACK PTO RADIATORS
A/C PARTS
COOLANT TUBES
DETROIT, ATLANTA, JOPLIN AND LOS ANGELES
(877) RAD-WORK (877-723-9675)
WWW.RADIATORWORKS.COM
CLICK HERE FOR MORE INFORMATION!

CNG Case Study

Environmentally Friendly Customer, Customer Friendly Supplier Team Up to Make a Real Difference in Winnipeg

Rudy Frank

CNG IS THE NEXT BIG STEP in Emterra Environmental's mandate to become an even stronger leader in environmental responsibility. With Heil as their partner, they will get there even faster.

EMTERRA ENVIRONMENTAL (BURLINGTON, ON) takes the "environmental" portion of its name seriously. With more than 400 trucks, 800 employees and 14 material-recovery facilities throughout Manitoba, Ontario, and British Columbia and serving about 10 percent of the entire Canadian population, the company's General Manager of metro Vancouver, Nevil Davies, did his own comprehensive research as to which supplier could best help Emterra to switch from traditional diesel-powered vehicles to CNG (Compressed Natural Gas) units that operate more cleanly, quietly and, ultimately, economically. All to support Emterra's overall corporate sustainability effort to dramatically reduce the environmental impact of its collection of waste and recyclables.

"To put it simply, we cold-called Heil Environmental," begins Paulina Leung, Emterra's Business Development Manager. "We liked everything we could find related to their proven CNG program, especially how seamlessly their fuel-delivery service was integrated between a chosen chassis and the Heil loader body."

But it wasn't just Heil's (Chattanooga, TN) promise to lower Emterra's fuel and maintenance costs, reduce idling noise and cut down on emissions that captured the Canadian solid waste giant's attention. "To say that the Heil response was timely and attentive is a vast understatement," continues Leung. "Their rep was on the ground in Vancouver within days to see first-hand our requirements so that he could accurately propose just which Heil products would best suit our objectives."

The Ideal Solution

But that sales call was just the beginning of Heil's coordinated approach to satisfy Emterra's search for the ideal CNG solution. Within days, the world's premier maker of ultra-durable, exceptionally productive mobile

Emterra Environmental's CNG fleet for use in Winnipeg, including that province's brutal winters, consists of a mix of Heil Rapid Rail® continuous-pack side loaders and PT 1000™ high-performance rear loaders.

Photos courtesy of Heil.

IF YOU ARE SERIOUS ABOUT QUALITY, INTEGRITY & EXPERIENCE, THE CHOICE IS CLEAR - MOBILE CONTAINER SERVICE

They say that imitation is the greatest form of flattery. For almost 30 years, Mobile Container Service,Inc. has been the name the waste industry has trusted for all of their container maintenance needs.
When you are as successful as MCS has been, it is a given that lots of companies will try and mimic what we do, some even try to copy our name! At MCS, we've always believed in providing our customers with the best services in the nation and maintaining the highest standards of quality, honesty and integrity.
WHEN YOUR COMPANY IS IN NEED OF CONTAINER MAINTENANCE SERVICES, CALL MCS AND LET US SHOW YOU WHY MCS IS THE NATIONS NUMBER 1 CONTAINER REPAIR COMPANY.

Anyone can make an ad, getting the phone to ring is easy. Building and maintaining a long term relationship takes integrity, good judgement and a history of doing things right.
That has been the MCS way for 30 years.

- Outsourcing for Maintenance Cost Control
- Head Count Reduction
- Pay Per Unit As-Needed Service
- Boost Your Container Inventory Without New Purchases!

North America's Number One Container Repair Company

WASTEC SWANA DCA

1-800-448-3785
WWW.MOBILECONTAINER.COM

CLICK HERE FOR MORE INFORMATION!

TEAM MCS

Heil's Rapid Rail side loader has a lift capacity of 1,600 lbs. and a lift cycle time of just eight seconds. The unit features a patented paddle packer that continually sweeps—and cleans—the hopper so that the operator never has to stop between stops to activate the loader arm. The result is substantially less downtime—plus, there are no shows, tracks or rails involved.

Heil's PT 1000™ rear loader compacts up to 1,000 lbs. per cubic yard with a packing cycle time of just 15 to 17 seconds and reloads in just six seconds. Its 3-cubic yard hopper is industry-renowned.

refuse collection vehicles, had arranged for several members of the Emterra decision-making team to actually tour not only the Heil design and manufacturing facility in Fort Payne, AL, but to also visit a few current Heil customers, including like titles in Pasadena, CA, who managed a similar field fleet.

"Heil made sure we also spoke directly with the equipment operator so we could learn the good and, frankly, the not-so-good points about all the equipment purchases we were considering for the city of Winnipeg and additional projects," states Leung. "Right there, that kind of unlimited access gave us a strong feeling that we were dealing with a company that would stand 100 percent behind everything it sold to us."

There were a few other key factors in Heil's favor as well. First of all, for more than 100 years, the company has been an unparalleled one-stop resource for virtually any type of refuse collection vehicles, whether they are front loaders, rear loaders, side loaders, and multi-compartmental styles. Its sales activities (direct and also through a nationwide dealer network) are completely backed by the waste management industry's most trusted service organization. "Heil has done hundreds of CNG installations matching ours," says Leung. "Their process, their history, their products, their desire to make things right all contributed to our choice. We have no margin for error when we undertake our extremely tight municipal contracts. Heil, from our very first interaction with them, made it clear that they not only could deliver to our timeframes and specifications, but that they also wanted our business. They carefully listened to our needs—and then their passion to work closely with us became clearly evident."

Selecting the Equipment

For use in Winnipeg, where temperatures sometimes drop to 40° (Celcius) below, Emterra selected some 60 Heil bodies, a mixture of Rapid Rail® continuous-pack automated side loaders and PT 1000™ high-performance rear loaders. All on Crane Carrier chassis, giving Emterra the world's largest fleet of CNG waste and recycling trucks for a truly cold-weather climate. But, just to be safe, some retrofitting was commissioned. "We added extra-large driers to our fueling station and large block heaters to all the Heil units," says Leung. "It now comes down to how well CNG performs in a Winnipeg winter. In a way, our order is a learning experience for Heil, too. To date, there have been no proven successes—by any CNG equipment supplier—in such frigid environments. We do know one thing, though: no matter what, Heil will stand behind its merchandise."

The Heil Rapid Rail® side loader, with a lift capacity of 1,600 lbs. and a lift cycle time of just eight seconds, features a patented paddle packer that continuously sweeps (and, thus, cleans) the hopper so that the operator never has to pause between stops to activate the loader arm. That means far less downtime and greatly improved productivity. In addition, there's never a need to clean behind the packer blade, either—a great convenience for the vehicle's driver. And there are no shoes, guide tracks, or guide rails to ever wear out.

"The unique paddle mechanism results in low cost of maintenance, low cost of ownership," claims Leung. "Plus, its arm has an extended reach (96 inches), an ability to maneuver in very tight spaces and a wonderful overall track record."

Heil's PT 1000™ rear loader, with compaction up to 1,000 lbs. per cubic yard and a class-best packing cycle time of 15 to 17 seconds, comes equipped with an industry-renowned 3-cubic yard hopper and reloads in a blistering five to six seconds.

Adds Tom Binder, Heil's Western Regional Manager: "Fer-Marc Equipment, our Canadian dealer, did an extraordinary job demonstrating the superior payload capacities and low-maintenance benefits of Heil's Rapid Rail and PT 1000 loaders to Emterra. Fer-Mac's support, from the initial inquiry to the actual deal, enabled Emterra to make a confident equipment choice."

The Next Step

"We don't just talk the 'green' talk—we actually walk the walk," concludes Leung. "CNG is the next big step in our mandate to become an even stronger leader in environmental responsibility. With Heil as our partner, we'll get 'there' sooner versus later." | WA

Rudy Frank *is 35-year veteran of authoring B2B case studies and is VP of Branding and Marketing Communications at Mirage MarCom, a Marketing Strategy and Tactics agency in Monroeville, PA. He can be reached at (412) 372-4181, ext 130 or e-mail rfrank@mirageadv.com.*

For more information, on Heil, contact Jennifer Shaffer, Corporate Manager, Marketing Communications, at (423) 855-3488 or e-mail jshaffer@doveresg.com.

Breakthroughs and Innovations

Is your straight truck tired or worn out? The cost of a new straight truck is approximately $160,000 while a new roll-off trailer is only $43,950. **L.C.B. ENTERPRISES, INC.** (Taylor, MI) introduces the Pit Bull—strong, stable and compact. This model is 26' long with a Stinger Tail. It will haul 24' x 8' high boxes. The 60 dump angle assists in unloading "stubborn" loads.

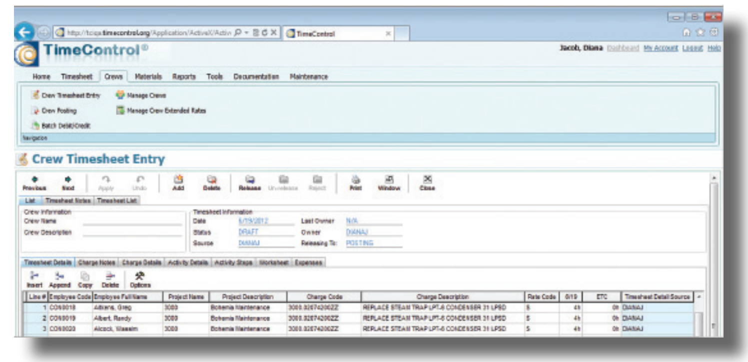
L.C.B. Enterprises knows that your tractor is used for more than one job! Increased legal payload (40,000 lbs. in most states) over any roll-off truck, means fewer trips. Durable 4" hinge pin, gives a more reliable, extended life over smaller pins. You will benefit with increased profit through the better use of underused highway tractors in your fleet. A short tractor with the Pit Bull roll-off trailer is far more maneuverable than that of a roll-off truck.

Features include:

- 12,600 lb. Tare
- 5/8" x 5" Top Flange
- 3/4" x 5" Bottom Flange
- Four 12" Cross Members Inside Neck Stiffener
- Dual Hoist Cylinders for Stability
- Control Valve Mounted Outside for Easier Access—Covered with Steel Box for Operator Safety

Life is about choices. You now have a choice in roll-offs.

FOR MORE INFORMATION, CALL OUR DEALER LCB SALES CO. AT (734) 442-6183.



HMS SOFTWARE (Pointe Claire, QC) announces the release of TimeControl Industrial. TimeControl Industrial 6.4 has been designed specifically for field data collection of labor and non-labor usage on industrial and construction field sites. This builds on the already popular functionality of the classic TimeControl and delivers a timesheet system that can be used simultaneously for back office and field personnel as well as a field data entry systems for material consumption, equipment usage and even production values accomplished.

TimeControl Industrial adds several elements of functionality that are ideally suited to collecting data in heavy construction, offshore, industrial or plant shutdown environments where the employees doing the work don't have access to computers to enter the data themselves. These functions including Crew Timesheet Entry, Material/Equipment/Production Entry and Extended Rates

TimeControl Industrial includes all the functionality that has made TimeControl one of the world's most respected timesheet systems including links to project management systems such as Oracle-Primavera, Microsoft Project and Deltek's Open Plan. It also includes links that can be defined for Payroll, HR and Finance systems as well as ERP systems such as PeopleSoft, Oracle Financials and SAP. TimeControl Industrial is available immediately. Clients with current support contracts have access to the upgrade at no cost.

FOR MORE INFORMATION, CALL (514) 695-8122 OR VISIT WWW.HMSSOFTWARE.CA.

New DAYLube high performance grease from **DAYTON PROGRESS** (Dayton, OH) uses nanoceramic particles which act as sub-microscopic ball bearings to provide continuous lubrication to steel surfaces found on heavy equipment like loaders, dozers, haul trucks, excavators, skidders, crushers and more. With a much lower coefficient of friction at all temperatures than traditional PTFE greases, chemically inert DAYLube is also environmentally friendly. It maintains its viscosity across the full temperature range and does not soften or run out—after 100,000 production strokes it shows no evidence of breaking down. Extraordinary adhesion extends production up to 10-times that of other greases. This proven nanoceramic lubricating grease provides unparalleled friction reduction and wear-resistance, making it ideal for a wide range of heavy equipment and attachments.

DAYLube operates in temperature ranges from -40°F to 800°F and the nanoceramic particles remain intact to 2500°F. It survived the ASTME 4-ball weld test with no weld and minimal damage to all ball bearings. Competitive brands, on the other hand, produced a soft weld after two seconds and complete failure and major damage to all bearings. DAYLube has high load-bearing properties, a low dielectric constant, does not contain metal or silicone and is resistant to steam, acids and most chemical products.

DAYLube is available in 16-ounce tubes and 16-ounce jars, gallon and five gallon containers. Industries benefiting from the use of DAYLube include construction and earth moving equipment, landscape contracting equipment, agricultural, automotive, aerospace, industrial machinery, general manufacturing, marine, material handling, stamping and fabricating, truck and bus, and more.

FOR MORE INFORMATION, CALL (937) 859-5111 OR VISIT WWW.DAYTONPROGRESS.COM.

VISIONAIRE INC. (Grand Prairie, TX) an OEM provider of air conditioning and heating products, announces a new line of specialty cab heaters for heavy duty off-highway equipment. These ducted heaters are compact, have a powder coated steel chassis and provide an abundance of heat in a small package.

The new heaters use long lasting SPAL blowers. Coolant hose connections can be made at the back or bottom of the heater. Three speed blower motors enhance function and operator comfort. Defroster models are available with one to four 2 1/2" duct connections. Duct hose, defrost louvers, heater hose and coolant valve components are available through Visionaire, Inc.

FOR MORE INFORMATION, CALL (972) 647-1056 OR VISIT WWW.VISIONAIRE-INC.COM.

Breakthroughs and Innovations

To meet the EPA's Industrial Stormwater exposure requirements, **TB INDUSTRIES** (St. Michael, MN) has developed a lightweight but durable cover for all sizes of roll-off containers. These covers are constructed of corrugated polycarbonate over an aluminum frame making them strong, corrosion-resistant and UV protected. Opening to a full 90 degrees for easy access to the entire container and needing less than 35 pounds of lift to open and close, these covers are designed with ease of operation and durability in mind. These covers are also lockable to protect container contents from theft. Servicing the entire US and Canada, TB Industries' covers are available with permanent or removable mounting systems and all of them can be customized to fit individual needs and sizes. Other products are also available for roll-off containers and lugger boxes.

FOR MORE INFORMATION, CALL (763) 428-2214, E-MAIL INFO@TB-IND.COM OR VISIT WWW.ROLLOFFCOVERS.COM.

RIDEWELL (Springfield, MO) announces the expansion of the RAR-240 series of trailer air-ride suspensions. Now available for order are yoke mount suspensions designed specifically for use with Ridewell brand axles with Wabco PAN 22 air disc brakes. The new suspensions can also be used with IMT's axles with Wabco Pan 22, 19, or 17 ADB, or Haldex ADB. Two new designs are available for order.

First, the yoke trailing arm beam that allows the brake actuator to be placed under the tail. A critical benefit of this design is that no modifications to the trailer frame beyond those typically done for a standard RAR-240 yoke suspension are required. Also, no change to the normal frame transition geometry is required. Compatible only with Wabco PAN 22 or Haldex ADB.

When brake actuator ground clearance and protection are critical, the newly designed yoke trailing arm below has a 'banana beam' that allows the brake actuator to be tucked between the beam and trailer frame. This design requires a more 'squared-off' frame transition to allow clearance for the actuator.

FOR MORE INFORMATION, CALL (877) 434-8088 OR WWW.RIDEWELLCORP.COM.

WasteAdvantage magazine

The Advantage in the Waste and Recycling Industry

Recycling Transfer Stations Landfills

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.

Contents

Q&A
Iowa's EMS: Going Beyond Waste Diversion

Beverly Davis

EVERY SOLID WASTE MANAGER KNOWS THAT STANDARDIZED WASTE diversion goals and recycling rates aren't sustainable or best environmental practices for the 21st century and beyond. The limitations inherent with waste diversion regulations have dogged landfill managers—and regulators—for decades. There is a growing need by the industry to find a better way of regulating and managing landfills that would change the focus from "disposal management" to "environmental resource management."

Offering an alternative to waste diversion, Iowa is leading the industry—and providing a successful template for others to follow—with its first-in-the-nation EMS, or Environmental Management System, voluntary law (HF 2570) that was unanimously passed by the state legislature in 2008. After a successful three-year pilot (2009-2011), EMS is now being offered statewide to all permitted landfill facilities.

Iowa's EMS was developed and implemented through a collaborative effort that included the solid waste industry, State regulators and lawmakers. Tom Hadden, Executive Director, Metro Waste Authority (MWA), Brian Tormey, Bureau Land Chief, Iowa Department of Natural Resources (DNR), and State Representative Donovan Olson (IA-D) were integral in designing the EMS law—they are interviewed for this article.

What is the EMS law and concept?

Tom Hadden: The EMS law is an Environmental Management System based on continuous and measureable improvements in six areas—greenhouse gases, household hazardous waste, yard waste management, recycling services, water quality improvement and consumer environmental education—all of which we [landfill managers] can control unlike diversion rates, where we have limited control. EMS is a holistic approach that looks at the entire waste stream cycle. We use computer software to track and measure continuous improvements focusing on resource management. Each solid waste agency defines their objectives in an EMS plan, which allows for flexibility, so that we can design activities and procedures based on our individual community needs and goals. EMS is not about hitting homeruns. EMS is about hitting singles every day with small, continuous improvements that over the long haul add up to big efficiencies, which is also consistent with best environmental practices.

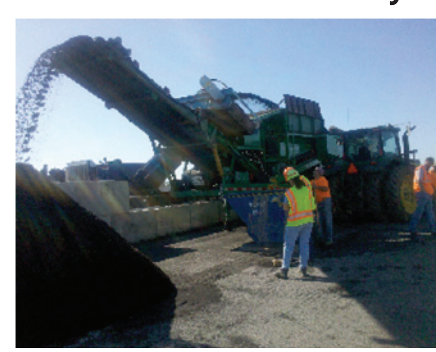
Brian Tormey: Iowa's voluntary EMS law consists of a set of management practices that follow general EMS guidelines: Plan, Do, Check, Act. The EMS program includes implementing a process for solid waste agencies to demonstrate regulatory compliance while identifying and engaging in activities—in the six environmental areas—that reduce solid waste, enhance environmental benefits, promote sustainable resource use, increase operational efficiencies and management effectiveness, decrease risk and liability, and commit to continuous improvement. With EMS, we've taken the focus away from "disposal management" and switched it to "environmental resource management."

Rep. Donovan Olson: The purpose of Iowa's EMS law is to encourage responsible environmental management and solid waste disposal and to promote better environmental stewardship. It is a voluntary, non-regulatory approach to meeting the provisions of the state's Groundwater Protection Act. EMS participants are allowed to set aside the waste reduction regulations. They may qualify for financial assistance to implement their plan. EMS also partners the DNR with 44 public solid waste agencies, such as Metro Waste Authority, and four private landfill operators, where they are all working together to achieve EMS goals.

Who came up with the idea of an EMS law and why?

Brian Tormey: In 2006, DNR developed a position paper called *Vision for the Future*, based on the fact that while waste reduction had been good, it had hit a plateau. Instead of only looking at the waste reduction metric as our primary driver, we needed to start looking at resource management because solid waste agencies and their interaction with the environment extend way beyond just putting trash in a landfill. We invited a group of stakeholders together to discuss the paper's recommendations and see if there was interest in developing an alternative to waste diversion regulations.

Tom Hadden: Brian Tormey set up a two-day meeting that brought all of the stakeholders—solid waste managers and state regulators—together to discuss what new options to waste diversion might be out there. A lot of us [solid waste managers] were struggling with chasing diversion goals because we



MWA cleans and grinds shingles diverting 3,700 tons from landfill.
Photos courtesy of Metro Waste Authority, Des Moines, IA.

knew that diversion alone wasn't a sustainable system. Some could do it easily, basically without doing much, and others were working really hard, but not getting the numbers. At the end of our meeting with Brian, we agreed to start designing an alternative to waste diversion—EMS. To keep the ball moving, we sat down with Representative Donovan Olson, who had an understanding of diversion goals and landfills.

Rep. Donovan Olson: I had experience overseeing a landfill in Boone County as a member of the Board of Supervisors and I saw how easy it was for us to meet our diversion goals simply by taking credit for reductions at the Ames Resource Recovery plant that burns solid waste. Although the Boone Solid Waste Agency was very involved in recycling, we could have stopped recycling and other good environmental programs and still met the reduction goals. Then, I learned about other landfills that were doing everything they could to recycle, reduce and divert waste, but couldn't meet their reduction goals for a variety of reasons beyond their control. When Brian and the solid waste agencies came to me with their EMS alternative, I immediately recognized that EMS had the potential to drive innovation and creativity and that's when I decided to make EMS the focus of my energies as Chair of the House Environmental Protection Committee.

How long was EMS in the works before it became law? When was the EMS law passed?

Brian Tormey: It happened fairly quickly after we vetted our white paper with representatives from the solid waste agencies, small and large, in 2006. In 2007, we worked together as a group, reviewing DNR recommendations and educating ourselves on what EMS was and how it could work within the heavily regulated solid waste industry. We took our recommendations to Representative Olson, who helped us craft HF 2570 also known as the EMS law. HF 2570 passed unanimously by the Iowa Legislature in 2008 and our three-year pilot projects—six solid waste agencies from the smallest with five employees to the largest with 60 employees—started in 2009.

Who were the primary supporters?

Tom Hadden: Landfill agencies [ISOSWO, Iowa Society of Solid Waste Operations], Representative Donovan Olson and the DNR supported EMS. The environmental groups—Sierra Club, Iowa Environmental Council and the Iowa Recycling Council—even supported EMS or, at least, didn't fight it. We met with each of them, explaining why we needed EMS and what we were trying to achieve.

How did you manage to pass an EMS bill with a unanimous vote of Republicans and Democrats in a highly polarized political environment?

Brian Tormey: There wasn't anything threatening in the bill. It was voluntary. The legislature allocated monies to support it, but it didn't require any new funding source. We diverted money from our solid waste alternatives program funding. While no legislation is perfect, for years the landfill folks

Scott County's E-Waste facility increased business recycling by 360 percent. Photo courtesy of Waste commission of Scott County, Davenport, IA.

MWA's recycled shingles are re-used in hot mix asphalt

were saying they needed another system and we made it easy for the legislators to get behind it by doing our homework with all of our stakeholders.

Rep. Donovan Olson: Because the process was inclusive, open and non-partisan, it avoided the typical partisan bickering associated with much of the legislation you hear about today. It was truly an effort to replace a convoluted program and a strict fine-based regulation (waste diversion) with a non-regulatory alternative that encourages innovation and creativity. People still believe in a common sense approach to solving problems. I think the EMS legislation represents a way that we can get things done in the future.

How does Iowa make it easier to adopt an EMS program?

Brian Tormey: Some regulations such as the standardized waste reduction requirements and associated penalties if you didn't meet diversion goals are waived for EMS participants. The State also provides technical assistance in the form of EMS training and EMS consultants—meetings, onsite visits by consultants, Webinars and conference calls—Intelex software (to track and measure EMS program results), greenhouse gas calculators and special grant funding. The state grants included $20,000 for new applicants, or Tier I, and $50,000 for Tier II agencies to help pay for EMS implementation. Our outside EMS consultants, GS&P, had their boots on the ground and this is one key to the successful results landfill managers experienced with EMS.

Tom Hadden: Iowa has actually put some resources into moving solid waste agencies in the EMS direction by offering grant funding, special software to measure results, and onsite consultants, because training is essential. The learning curve is pretty steep and getting your staff on board takes awhile because it's a lot more work than the waste diversion system.

How was the EMS program designed and what are the essential elements included?

Tom Hadden: Iowa's EMS program was designed by a nine-member Solid Waste Alternatives Program Advisory Council and based on six components that landfill managers could have control of—greenhouse gases, household hazardous waste, yard waste management, recycling services, water quality improvement and consumer environmental education—to facilitate implementation of EMS and guide solid waste agencies through the EMS process. Continuous improvement is the standard measurement for each EMS program and the basic concept for EMS.

Brian Tormey: Our EMS program follows the Plan, Do, Check, Act process that is consistent with general EMS guidelines. Our participants include 10 essential elements in their EMS programs: Environmental Policy Statement, Environmental Impacts, Objectives & Targets, Action Plan, Identify Roles & Responsibilities (staff), Communication, Training & Awareness (staff), Monitoring & Measurement, Assessment, Reevaluation and Modification, and Legal & Other Requirements. An internal and external audit and report are required annually and reviewed by the Advisory Council.

What are EMS' benefits?

Tom Hadden: EMS produces concrete results. EMS pushed us to be more proactive on safety and compliance issues. All of the EMS pilot solid waste agencies, including Metro Waste Authority, documented reduced

'No Idle' policy reduced Dubuque landfill's carbon footprint by 50 percent.
Photo courtesy of Dubuque Metropolitan Area Solid Waste Agency, Dubuque, IA.

environmental risks, increased operational efficiencies, improved employee moral and greater conservation of natural resources. It's environmentally sound and you feel a whole lot better at the end of the day, because you're doing the right thing.

What's the timeline in starting an EMS program?

Brian Tormey: We realized with our first six pilot solid waste agencies—from the smallest to the largest—that 12 months wasn't long enough. Based on the experience of the EMS pilot agencies, we now expect 18 months for new EMS participants to train their staffs and complete the planning process so they can start implementing their EMS programs in the second year. Starting an EMS program can be daunting for the newly initiated so that's why the DNR provides experienced outside EMS consultants to landfill managers.

What are some examples of EMS programs that resulted in measurable positive impact on the environment?

Brian Tormey: The variety of EMS projects in Iowa range from CFL recycling and e-waste facilities to a big push for household hazardous recycling and nearly everything in between. They may seem small, but small, continuous and measureable improvement is the basis for EMS, which holds the potential for better environmental stewardship and cost-effective landfill management.

There is a new shingle-recycling program at Metro Waste Authority. Previously, the shingles used to land in the landfill. Now, they are delivered to MWA, cleaned for any debris, metals and nails and then ground up and sold for use in hot mix asphalt for roads. It results in 3,700 tons of shingles recycled and diverted from the landfill, increased revenues and reduced environmental footprint.

The Waste Commission of Scott County operates the only publicly managed de-manufacturing E-Waste facility in the State, earning the R2 (Responsible Recycling) Certification as a direct result of their EMS program. As a result, business waste recycling rose by 360 percent in six months, adding 200 new business-recycling clients in six months.

Dubuque Metropolitan Area Solid Waste Agency instituted a 'No Idle' engine policy, requiring all vehicles at the Dubuque landfill to shut off their engines when not in motion. This new EMS policy reduced the facility's carbon footprint by 50 percent from 2009 to 2012 and improved air quality.

Rathbun Area Solid Waste Agency initiated their new EMS school recycling program in six separate school districts by promoting permanent and comprehensive recycling education outreach efforts—brochures, community meetings, recycling events, installing large recycling containers in all school buildings—resulting in 12.14 tons recycled for the school year 2010 to 2011.

Cass County's Vermeer BC 1500 Wood Chipper—part of their new EMS program—is now used by all of their rural county towns, including the county, to ground tree limbs and brush, resulting in less open-air burning and improved air quality. Communities also reuse the woodchips for their civic gardens and beautification projects.

Why has Metro Waste Authority signed up for the new EMS program?

Tom Hadden: My government career has always focused on the best way an organization can target resources and use them wisely. I always viewed waste diversion as an unsustainable environmental policy. EMS changed the whole paradigm with the goal of viewing waste as a resource by making continuous small improvements in those areas I can control. EMS encourages creativity and flexibility and rewards innovation. It is consistent with best environmental practices. EMS also helps our organization move forward by hiring people who are more open to change. It's just a smarter, better way of doing business and caring for the environment. Any landfill can start an EMS program. You don't have to wait for a law to be passed to do it, but the training is important and Iowa's grant funding is also a big bonus. | **WA**

For more information on Iowa's EMS law, contact Leslie Goldsmith at (515) 281-8499 or via e-mail at Leslie.Goldsmith@dnr.iowa.gov or visit www.iowadnr.gov/InsideDNR/RegulatoryLand/SolidWaste/ComprehensivePlanning/SolidWasteEMS.aspx.

Recycling

Second of Three Parts

Organics Diversion: How Do We Get There from Here?

Noel Lyons and Lynn Lucas

RECYCLING THE ORGANIC FRACTION OF THE MUNICIPAL SOLID WASTE (MSW) stream has become a national priority. What started with yard waste now includes food waste and diversion of these biodegradable materials from landfills; incinerators are also carrying pallets, dirty paper, waxed cardboard and other organics to composting, with some of this side-streaming taking place outside of traditional waste management systems.

A recent trade industry publication revealed that the number of communities with source separated organics (SSO) programs has grown by more than 50 percent since 2009. The number is small—only 150 communities among 16 states—but it does not include the new crop of enviropreneurs offering commercial collection and composting services.

Times are changing. Food waste and other organics are bypassing transfer stations and landfills by the truckload because the economic, humanitarian and environmental benefits of diversion have proved to be significant and far-reaching; in less than 20 years, composting has moved from the backyard to the mainstream.

Composting Goes Industrial

Driven by the need to recycle nutrient-rich, high-moisture materials along with the yard waste—everything from food waste to biosolids to fats-oils-grease—commercial composting overcame a plague of over/under-designed facilities in the early 1990s to become the efficient, environmentally-secure, industrial-scale operations of today.

This segment of the waste industry has, for the most part, abandoned both outdoor windrows and over-engineered operations that were unreliable and not cost-effective, finding an efficient, profitable middle ground that represents the future face of composting. In a properly-managed, indoor facility, odor is controllable and leachate is a non-issue. What remains is a true manufacturing process where sophisticated air handling systems, biofilters and computerized controls exist to create and maintain the ideal environments for the microbial populations responsible for biodegradation. The result is rapid throughput on a smaller footprint, a self-pasteurizing process, public acceptance and a premium compost product with real dollar value.

Today's designs and processes also deliver the ability to manage a wide variety of materials with differing moisture levels simultaneously, greatly contributing to economic viability. The correct balance between materials handling and process automation leads to simpler systems offering flexibility, ease of operation and cost-reductions. The depth of knowledge gained from more than two decades of academic/field research and hands-on experience has given the industry a better understanding of the science of composting, professional training programs and improved tools for "recipe" development.

Perhaps the greatest boon to composting has been the vastly improved compost product with the predictable quality demanded by the professional landscaping, turfgrass and erosion/stormwater control industries. By developing formulations specific to the requirements of these distinct user groups, commercial composting has created high-value, volume markets for

Composting's future lies in the construction of indoor, industrial-type operations.

Photos courtesy of McGill Composting.

its products. No manufacturer of quality compost has a problem selling high-performance products in today's marketplace.

Economics Drive Commercialization

Achieving the current level of design, technology and product performance is important for only one reason, and it isn't waste recycling. Ensuring the commercial viability of composting (the process) guarantees the supply of compost (the product), a material essential to the restoration of topsoil and natural soil functions as they relate to clean water, food production, chemical reduction, energy and water conservation, and stormwater management.

Composting, once squarely within the purview of the public sector, is following the landfill's lead and shifting to the private sector, which has expertise and capital. But commercial composting is a microdot compared to the giant sphere that represents those who own or control collection infrastructure, ideal composting sites and the bulk of today's organic feedstocks. Obviously, if the evolution is to progress at anything other than a snail's pace, collaborations will be required, and the effort will be economically beneficial to all parties. Currently, small, windrow operations dominate the composting industry, but that has to change. Based on today's more successful commercial operations, here is what the next generation composting businesses will probably look like:

- A regional facility in concept, but local by definition, since it makes neither environmental nor economic sense to transport garbage long distances.
- An appropriate, industrially-zoned site, located within 50 miles of a sufficient number of targeted, high-volume generators.
- Environmentally-secure, indoor or encapsulated processing with biofiltration.
- A processing capacity of 50,000 to 200,000 tons per year on a footprint of 4 to 20 acres.
- A high level of process control, most likely, some type of aerated static pile.
- Materials handling systems that are simple, flexible and don't rely on a lot of automation.
- Professional sales and marketing for both intake and product sales.
- A true manufacturing approach, with product sales contributing significantly to the revenue stream.

Collaborations Can Build Infrastructure

Hundreds of new composting facilities of this size and type will be required to meet recycling goals, making siting the greatest challenge to infrastructure build-out. However, collaborating with commercial compost manufacturers and leveraging existing assets, owners of landfills, transfer stations, wastewater treatment plants, yard waste facilities and other suitable properties can reduce costs, offer organics recycling services to customers at competitive rates and make quality compost products available to their communities—all without capital budgets. It can also consolidate all organics recycling with one contractor and at one, professionally-designed and managed industrial facility. In exchange for their expertise and financing, composting companies gain good sites with appropriate zoning, buffers and traffic access, scales, stormwater treatment systems, compatible neighbors, feedstocks and compost markets.

Berkeley County, SC, offers a current example of successful public/private collaboration. It owns and operates its own landfill, including a yard waste composting operation. In the spring of 2011, the county solicited expressions of interest from the private sector to operate "green" waste management facilities on the property. Two companies were selected, resulting in a green energy

Raising the bar for composting operations means building facilities designed for compost manufacturing, not waste management.

facility currently under construction and an indoor, industrial-scale compost manufacturing plant in permitting. These companies will not only take over the county's yard waste management, but also biosolids, adding these materials to feedstock streams sourced from the entire Charleston region.

Through collaboration, the county leveraged its assets to secure long-term stability for the identified waste streams and acquired two state-of-the-art recycling facilities without a capital budget. At the same time, the millions of cubic yards of compost that will be produced and used in the region over the life of the composting facility will amend the region's coastal soils to help protect local watersheds.

Whether the Berkeley County project becomes a model for collaborative infrastructure development or stands alone as a unique undertaking largely depends on those who hold the assets. Berkeley understood not only its own needs, but also those of for-profit entities operating in a highly competitive arena. That isn't always the case, as evidenced by the number of solicitations for organics recycling projects that fail for lack of qualified respondents. Too many strings can tie a commercial composting company up in knots and render a potential project unprofitable, no matter how ideal the site. Successful collaborations must work for both sides of the equation.

Assuming the Role of Facilitator

At first glance, the challenges of zero waste seem daunting. But site and collection assets, technologies, expertise and financing are already in place. By assuming the role of facilitator and bringing it all together through collaborations, today's waste management industry can meet and survive the challenge of diversion, securing its continuing leadership in an increasingly-recyclable world. | WA

The final part of this series will focus on what will we get for the investment?

Noel Lyons is president and co-founder of McGill Environmental Systems (Harrells, NC), a leader in the establishment of indoor, industrial-scale composting as a revenue-producing service and recycling technology for mainstream waste management.

Lynn Lucas is a project developer for McGill Environmental Systems, specializing in business development, communications, marketing and branding.

They can be reached via e-mail at thecompostpeople@mcgillcompost.com or visit the Web site at www.mcgillcompost.com.

Landfills
How Much Does my Landfill Leak?

Abigail Beck, M.S., P.E

THE QUESTION OF HOW MUCH LANDFILLS LEAK MIGHT BE THE MOST contentious question in the solid waste industry and the one with the most elusive answer. Leakage can be predicted using models of varying levels of sophistication, but modeling relies on accurate data for hole frequency and size. Published statistics for hole size and frequency vary widely and most of the published data is drastically out of date and out of context for construction practices in North America. The prescribed method of monitoring existing landfill leakage through single-lined landfills is through a groundwater monitoring network, but once contamination is detected it is already too late. The only feasible way of remedying the problem may be to cap and close the portions of the landfill that are leaking, which may jeopardize crucial operating revenue. In extreme cases, groundwater remediation may be required, which is costly and may or may not be effective depending on the hydrogeologic conditions (the types of soil under the site and how the groundwater flows through them). The obvious solution is to build landfill liners that don't leak, but the simple laws of chemistry and physics, not to mention Murphy 's Law, preclude this possibility.

Estimating Landfill Leakage

An estimate of landfill leakage is often calculated indirectly using the Bernouilli or Giroud equations if the hole size and frequency are known (Giroud et. al., 1997). Leak frequency and size statistics are generated from the results of geoelectric leak location methods. However, published leak location statistics come from various leak location methods on various applications in many different countries with highly varying and sometimes nonexistent, construction quality assurance (CQA). All of these conditions affect leak frequencies greatly. Average hole size and frequency contributing to leakage depends heavily on the skill of the liner installer and the skill of the CQA agency. Several studies have shown the significant reduction in hole frequencies and leakage in the presence of CQA during construction (Forget et. al., 2005, Bonaparte and Gross, 1992). This concept can be expanded to an improvement in construction quality with rigorous CQA as opposed to poor or inattentive CQA. Since standards and minimum experience qualifications are relatively high for landfill expansions in the U.S., in my experience, the average hole frequency is far less for landfill expansions in this country than in most other applications in other parts of the world. That being said, hole frequency does not always translate directly to leakage rates, since the types of damage typically created during placement of the cover material, such as ruts from dozer tracks, rips and scrapes from dozer blades, and rocks pushed through the liner, can be far more significant for leakage rates than knife slices or pinholes occurring during liner installation.

Landfill Liners

Whether or not holes are created by equipment placing cover material depends on the placement method and the care in which the method is executed. It also depends on the quality control of the cover material and whether or not the material has been screened. Finally, it depends on the level of care of the CQA technician watching placement of the cover soil material. Tremendous care is given to the placement of the leachate collection and recovery system (LCRS) drainage layer and operations soil layer over landfill liners. Damage attributed to cover soil placement is rarely found in the landfill industry in my geoelectric survey experience of landfill expansion cells since 2004, contrary to old statistics that claim that 74 percent of liner damage is caused by placement

Figure 1: Damage to polypropylene geomembrane from oversized particle found during a geoelectric leak location survey over cover soil at a water reservoir.
Photo courtesy of Geo-Logic Associates.

Percentage of Landfill Cells		
Leakage Rate (lphd) (b)	1992 (a)	2012(a)
<50	43%	73%
50 - 200	36%	24%
200 - 500	14%	3%
500 – 1,000	7%	0%
>1,000	0%	0%

Table 1: Distribution of average landfill leakage rates. (a) Year Data was published; (b) Liters per hectare per day; 1 gpad = 9.3 lphd. 1992 data Table courtesy of Bonaparte and Gross, 1992.

of the cover material (Nosko et al, 1996). When oversized particles are not controlled in the cover soil, punctures can and will happen to a geomembrane. **Figure 1, page 63**, taken at a water reservoir, is an example of this.

Double-Lined Landfills

Double-lined landfills provide the most accurate measurement of geomembrane leakage because the leakage through the primary geomembrane can be collected and quantified in the secondary containment system. Two published studies provide a comprehensive evaluation of landfill leakage through the primary liner—one study funded by the EPA in 1992 (Bonaparte and Gross, 1992) and a more recent study of leakage in the state of New York (Beck, 2012). The 1992 study showed average leakage data through the primary geomembrane from 14 landfill cells where CQA had been performed during installation. The 2012 study focused on the maximum monthly leakage values, so the published data cannot be directly compared to the 1992 data.

Previously unpublished data of average annual leakage rates from the 2012 study is presented here for the first time, allowing for a direct comparison between average landfill leakage statistics in 1992 and average landfill leakage statistics in 2012. Annual average leakage data from 37 double-lined landfills comprising 128 discrete landfill cells in the state of New York from the reporting year 2010 was organized into the same leakage bins as the 1992 Bonaparte and Gross study. The 2012 data includes several landfill cells, which had dipole surveys performed as part of cell construction. The percentage of landfills falling within the given leakage rate ranges is shown in **Table 1**, from the data collected in 1992 and the data collected in 2012. As a result of advances in installation quality and CQA practices, leakage rates greater than 50 liters per hectare per day (lphd) have decreased significantly in the past 20 years. It is therefore inappropriate to rely on old leakage data for estimating leakage through geomembranes using modern construction techniques

Locating Leaks

The best available technology for locating leaks in geomembranes before they become a problem is geoelectric leak location methods, also known as liner integrity surveys. These methods are covered by ASTM methods D6747, D7002, D7007 and D7703. The methods for exposed geomembranes (ASTM D7002, D7703) can be used to locate holes in the geomembrane immediately

after geomembrane installation. The bare geomembrane methods are sensitive enough to locate pinholes. The dipole method (ASTM D7007) is used after placement of the cover materials. Ideally, a bare geomembrane method would be used after geomembrane installation, then the dipole method would be used after placement of the cover materials. In this way, the very small holes created during liner installation could be located and repaired, then the dipole survey can locate any holes that might have been created during cover soil placement.

The 2012 landfill leakage study (Beck, 2012) provides a statistical approach to quantifying landfill leakage by calculating the probability of exceeding a given leakage rate in three cases: 1) if no geoelectric leak location survey is performed, 2) if only a dipole survey is performed, and 3) if both a bare geomembrane survey and a dipole survey are performed. The input parameters such as hole size and frequency used in the Bernoulli equation to calculate the probabilities were calibrated by the actual maximum monthly leakage data for landfills with and without dipole surveys performed as part of construction. Since the focus of the study was landfills in New York State, the probability of exceeding the state's Action Leakage Rate (ALR) of 20 gallons per acre per day (gpad) was calculated. The ALR is defined as the leakage rate at which a site will be required by the state to take action to repair the problems causing the leakage. Along with using modern construction methods and a rigorous CQA program, the results of the analysis showed that there is a 22.2 percent probability of exceeding the ALR if no survey is performed, a 7.1 percent probability of exceeding the ALR if only the dipole method is performed and a probability of 0.00001 percent of exceeding the ALR if both the bare geomembrane and dipole methods are performed.

Mitigate Future Risks

ALRs vary from State to State, but unless a landfill is completely double-lined, there is no way to immediately measure how much a single-lined landfill is leaking. Sites can only mitigate future risks by creating good specifications, upholding standards, hiring reputable installers and CQA agencies, and specifying a geoelectric leak location survey as a final check for liner integrity. | WA

***Abigail Beck** is a Senior Engineer and Director of the Liner Integrity Services Division of TRI Environmental, Inc. She has more than eight years and 70 million square feet of geoelectric leak detection survey experience and has authored over a dozen technical papers and articles. Abigail can be reached at abeck@tri-env.com*

References

- Beck, Abigail, 2012. "A Statistical Approach to Minimizing Landfill Leakage", SWANA, Washington D.C. Conference Proceedings.
- Bonaparte, Rudolph and Gross, Beth A., 1992. "LDCRS Flow from Double-Lined Landfills and Surface Impoundments", U.S. Environmental Protection Agency.
- Forget, Benoit et al., 2005. "Lessons Learned from 10 Years of Leak Detection Surveys on Geomembranes", Sardinia Symposium, Sardinia, Italy.
- Giroud, J.P., Khire, M.V. and Soderman, K.L., 1997. "Liquid Migration Through Defects in a Geomembrane Overlain and Underlain by Permeable Media", *Geosynthetics International*, Vol. 4, Nos. 3-4, pp. 293-321.
- Koerner, 2009. "Survey of U.S. State Regulations on Allowable Leakage Rates in Liquid Impoundments and Wastewater Ponds", GRI White Paper #15.
- Nosko, V., Andrezal, T., Gregor, T., and Ganier, P., 1996. "SENSOR Damage Detection System (DDS) – The Unique Geomembrante Testing Method", Proceedings of the First European Geosynthetics Conference EuroGeo1, A.A. Balkema, Rotterdam, The Netherlands, pp 743-748.
- Peggs, Ian D, 2009. "Geomembrane Liner Action Leakage Rates: What is Practical and What is Not?", Land and Water, July/August issue.

Celebrating their 30th year, **COLUMBUS MCKINNON** (CM) (Sarasota, FL) provides tire recycling equipment solutions and processes more than half a billion tires each year worldwide and continues to grow. Their systems are hard at work in hundreds of locations spanning five continents in more than 26 countries. Many of the most successful tire recyclers rely on CM for the highest quality, best built and lowest cost systems in the industry.

CM Shredders come equipped with their patented Holman Knife Design which is best known for their high production and ability to produce the highest quality chips for TDA/TDF applications. CM offers an extensive line of high volume tire shredding systems capable of processing everything from whole passenger car tires to light OTR tires into a variety of chip sizes.

CM's Zero Waste Systems include the patented 2R or 4R Liberator and Steel Reclaim Systems. Working together, these systems provide the most efficient liberation of clean high-quality steel while producing an impressive distribution of clean crumb rubber sizes allowing processors to market a variety of products.

Not only does CM build the most reliable equipment in the industry, but they also provide a full warranty and training for customers on proper operations maintenance and safety. CM always offers top-level customer service providing ongoing technical support as well as stocks and ships all OEM parts worldwide. CM prides itself on not just selling the best equipment, they also create solid working solutions for customers providing industry education, strong support, honest answers and superior customer service before and beyond the sale.

FOR MORE INFORMATION, CALL (800) 848-1071 OR VISIT WWW.CMTIRERECYCLINGEQUIPMENT.COM.

The new stylish Mobius Flex from **THE FIBREX GROUP** (Suffolk, VA) is not only very attractive, but also extremely durable and user friendly. This two-compartment receptacle is made from high quality rotational molded plastic and has an innovative anti-scratch surface. The Mobius Flex is perfect for collecting waste and recyclables in public spaces. Built to withstand the most demanding high traffic public areas and attractive enough for the most discriminate of locations, the generously sized drop-in openings give you the flexibility to collect a wide variety of recyclables, compostables and waste. Also perfect for the very popular single stream recycling programs, since the special recyclables opening will accept a wide variety of materials. The recyclables are collected inside with two rigid plastic liners that hold 25 gallons each.

Fibrex currently offers several decorative colors, but will be happy to custom produce the color of your choice. The Mobius Flex has several molded-in graphics application areas making it very suitable for custom graphics. You can use Fibrex's standard graphics and labeling or your own. They will apply your current logo designs or one of their sales representatives will work closely with you to design your custom logos and recycling labeling. Fibrex specializes in custom branded recycling containers and site furnishings. Your logo, your color, and your message can all be integrated into their products.

This recycling container is perfect for schools, universities, airports, military installations and facilities, malls, apartments and condominiums, hotels, convention centers and office buildings. Fibrex can offer you the most competitive factory direct pricing, custom designs and excellent customer service. The Mobius Flex looks attractive, is very durable and is priced at $695 retail and $350 wholesale.

FOR MORE INFORMATION, CALL (800) 346-4458 OR VISIT WWW.FIBREXGROUP.COM.

The amount of mercury in CFL bulbs, ranges between 4.5 milligrams to 5.0 milligrams. The amount varies depending on the type of lamp, the manufacturer and the date they were made. Although companies have tried to reduce the amount of mercury used to produce these bulbs, they are not yet able to completely eliminate the need for mercury. Millions of these bulbs are discarded with the household trash and become broken and they collectively contribute to the vast amount of mercury vapor released into the environment.

AMERICANA ENVIRONMENTAL's (Oak Bulb, IL) Bulb Terminator, through multiple patent-pending technologies, breaks the bulb and processes the mercury. The waste accumulated of glass, electronic components, metal and plastic can be disposed of as ordinary waste with no environmental concerns. It takes about three seconds to crush and recycle each bulb. Features include:

- Weather-resistant, designed for outdoor placement and operation
- Easy to operate with programmable coupon generator
- Disposes all types of CFL bulbs and tubes up to 48" long. Up to 8' bulb attachment optional
- Easy access for service and maintenance personnel
- Low cost and highly efficient replacement parts
- Two-year limited warranty on parts and labor
- Optional entry port for round bulbs up to 16"
- Optional 22" x 50" broken bulb mat attached to the front of the unit with a vacuum clean up system
- Captures all mercury for safe recycling and safe shipping to a recycling center

FOR MORE INFORMATION, CALL (630) 530-7995 OR VISIT WWW.AMERICANAENVIRONMENTAL.COM.

WITT INDUSTRIES (Mason, OH) introduces dome top recycling containers that can be customized to suit general or specific recycling requirements. The new 415DT-BK-R and 415DT-BL-R models are attractive, touchless, open-topped receptacles in either blue or black, to "dress up" sustainability initiatives. Each unit comes standard with a 5-inch "RECYCLE" and chasing arrows symbol—and can be further customized with a choice of decals to identify specific recycling streams. Aesthetically appealing, these new containers are ideal for facilities seeking compliance with green initiatives, including hotel lobbies, movie theatres, executive offices, malls, restaurants, airports, retail sites, coffee shops and more.

These attractive 15-gallon capacity receptacles feature an outer shell, which is crafted from durable, fire safe steel, and which lifts off a galvanized liner for ease of servicing. These new models combine style with functionality and provide a high-end appeal and long-term value for a single-stream collection container. Rolled-under stainless steel bottom offers floor protection. ADA and OSHA compliant.

FOR MORE INFORMATION, CALL (800) 543-7417 OR VISIT WWW.WITT.COM.

BRITESPAN BUILDING SYSTEMS INC. (Lucknow, ON) announces their new "APEX" Building Series. This new building design combines features from both the Atlas and Genesis Buildings. The APEX Building Series is ideal for the 80' and 100' wide market; it provides everything our customers have been asking for.

The APEX can be constructed to any length required and can easily be extended down the road. The design of the APEX provides exceptional sidewall clearance making it ideal for large equipment storage, commodity storage, salt/sand storage and livestock barns. BRITESPAN wanted to offer a building that is versatile with features customers have asked for. The APEX building can be customized to suit your building needs with doors, ends, ventilation and various foundation options.

FOR MORE INFORMATION, (800) 407-5846 OR VISIT WWW. BRITESPANBUILDINGS.COM.

We wish to thank everyone for all the support that has been given to us this past year.

From the *Waste Advantage Magazine* family to yours, we wish everyone a happy holiday season and a happy new year.

WasteAdvantage magazine

The Advantage in the Waste and Recycling Industry

Gary Orfe

Noreen Cocron

Marcus Rubio

Heidi Jensen

Elisa Weil

Angelina Ruiz