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ADVANCING COMPOSTING, ORGANICS RECYCLING & RENEWABLE ENERGY

SOURCE SEPARATED MSW COMPOSTING IN THE U.S.

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From Michigan and Minnesota to Washington and California, household organics are being separated and sent to specially-designed composting sites. Part II



Nora Goldstein

MUNICIPAL solid waste composting projects are being launched based on residential separation of the compostable stream from recyclables and trash - quite widespread in Europe and increasingly in Canada. One trend - typically in cities and suburban communities - is to add source separated residential organics to existing yard trimmings collection programs. Composting facilities permitted to receive food residuals, e.g., from commercial organics generators, have the capability to handle the residential organics stream. This makes it feasible for municipalities to "upgrade" their existing organics collection program, taking advantage of already-distributed containers, established truck routes, automated cart collection, and in some cases, split body vehicles (enabling cocollection of recyclables and/or trash on alternating weeks with the organics stream).

In this BioCycle 2005 report of MSW composting projects, Part I in the November issue concentrated on mixed MSW composting plants. In this December issue, Part II provides detailed analyses of residential separated organics programs.

ALAMEDA COUNTY, CALIFORNIA

Alameda County, across the bay from San Francisco, has embarked on a residential source separation program over the past several years. Recycling and composting programs in the county are overseen by Stopwaste.org (Alameda County Source Reduction and Recycling Board/Alameda County Waste Management Authority). There are 17 jurisdictions within Stopwaste.org; 13 of the 17 offer collection of source separated food residuals and soiled paper with the existing green waste program, according to Brian Mathews of Stopwaste.org. "To date, about 70 percent of the 378,000 households in the county have the program," says Mathews. "By June 2007, more cities will come on line for a total of about 90 percent of households in the county."

To date, about \$2.3 million - about \$8/household - have been spent on implementation, which includes purchase and distribution of kitchen containers for food scraps and public education and media outreach. All households already have weekly cart-based green waste collection service. "Current participation is about 20 to 30 percent of households, although some cities have participation as high as 50 percent," adds Mathews. "Overall, about 6,500 tons/year of food residuals and soiled paper are being diverted." Residents can set out all food scraps, including meats and dairy products. Three composting facilities in the region, which already process green waste from these jurisdictions, receive the household organics. These include the BFI Recyclery on Newby Island in San Jose, Grover Landscape Services in Modesto, and Z-Best Composting in Gilroy. The cities of Oakland and Fremont represent the two largest jurisdictions offering the program. Fremont has about 46,500 single family homes. Its household organics program

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began in July 2003. "It was rolled out as an expansion of the city's existing green waste program," says Cynthia Virostko with Fremont's Environmental Services Division. "Households already had green yard waste carts. At the time, we were introducing our single-stream recycling program, where we went from a three bin recycling system to a single stream, one cart system. Attached to the inside of every recycling cart with orange fluorescent electrical tape was a food scrap kit, including a kitchen pail and a packet of information inside the pail that described the program and what materials could be put into the green cart, which we now are calling the organics cart." Stopwaste.org gave the city of Fremont a grant for the kitchen food scrap pails, manufactured by Norseman.

A dual-chamber truck cocollects the recyclables and organics each week. Residents are encouraged to wrap food scraps in newspaper or place them in a paper bag. The biggest concerns voiced by residents have been about possible odors and the potential to attract flies, rodents and other pests. To date, neither has appeared to be a problem. Since the program in Fremont was rolled out, the city has been doing quarterly food scrap audits. "We just completed the fifth audit," adds Virostko, "and the participation rate has stayed constant. About 25 percent of households setting out the organics cart include food residuals and soiled paper. We audit the same routes each time, which cover low, middle and high income housing."

Fremont's organics go to the Newby Island composting facility operated by Browning-Ferris Industries. Because the food scraps are such a small volume compared to the green waste received, they are handled in the same manner as the green waste. Trucks unload and visible contaminants are pulled out. Green waste and food scraps are ground in either a CBI or Diamond Z grinder, then composted in windrows. Newby Island processes finished compost through a Morbark and a Powerscreen trommel screens. "Essentially, the addition of household food scraps to the green waste has had no impact on our program here," says Hilary Gans of BFI. "It pretty much disappears in the windrows. Our main concern with the household organics program was the allowance of nonrecyclable paper other than pizza boxes and soiled napkins and paper towels. So much food packaging has plastic associated with it, e.g., the microwavable food containers, boxes that frozen cakes and pies come in, etc. Those boxes are polycoated and that material just doesn't compost."

Grover Landscape Services, Inc. in Modesto receives residential food residuals from the cities of Berkeley and Oakland in Alameda County. Berkeley has been sending its residential organics to Grover for a number of years. Like BFI, the amount of food scraps in the green waste loads is negligible therefore no changes have been made to its materials handling processes. "We receive about 1,000 tons/day of green waste and a minimal amount of food waste," says Jake Oasterman of Grover Landscape. "All green waste is ground to about six-inches in size, then screened in a trommel with 4-inch holes. The 4-inch minus fraction is composted in windrows and the overs go to biomass fuel. He adds that the facility's permit allows them to take the residential organics but that a different permit would be required to receive commercial organics.

The Z-Best composting facility in Gilroy also notes that the food scraps it receives from Alameda County is negligible compared to the volume of green waste and commercial organics that are processed. The Z-Best plant is designed to take "organics-rich" loads from commercial generators, i.e., generators with significant quantities of organics in their waste stream are targeted for diversion. Those loads go through an upfront sorting line that includes a screen and a picking station. Green waste with residential organics added do not go through that presort line. Those loads are ground and put directly into windrows, whereas the organics-rich loads are first composted in aerated bags supplied by Versa Composting, then in outdoor windrows.

Alameda County is in the process of siting its own composting facility within the county's border. It is going through environmental impact studies. The facility is designed to process 600 tons/day of green waste and source separated organics from residential, commercial and institutional generators in the county. Originally, feedstocks were going to be composted in windrows, but subsequently it was decided to use aerated static piles in order to capture and treat odors.

SAN FRANCISCO, CALIFORNIA

The city and county of San Francisco's Fantastic 3 program is the largest and longest running residential source separated organics composting project in the United States. The 3-stream residential cart-based collection program includes organics, single stream recyclables and trash. All of the city's nearly 150,000 single-family households receive the service. With minimal volumes of green waste (five percent of the waste stream), the city targeted residential and commercial food scraps and soiled paper as the key to meeting and surpassing California's mandated 50 percent diversion goal by 2000. San Francisco's diversion rate reached 63 percent in 2002," says Jack Macy, Commercial Recycling

Coordinator in the City and County of San Francisco's Department of the Environment. "San Francisco has a population of nearly 800,000 in 47 square miles, with 40 percent who don't speak English at home. While these demographics are challenging, we have achieved a lot in a relatively short time."

Norcal Waste Systems and its subsidiaries service the city and county of San Francisco's programs. Its two hauling companies, Sunset Scavenger and Golden Gate Disposal, have the residential and commercial collection contracts. Source separated organics are taken to a transfer station and then hauled to Jepsen Prairie Organics in Vacaville, or South Valley Organics in Gilroy.

Between the residential and commercial source separated collection programs, about 80,000 tons are collected annually. The bulk is sent to Norcal Waste System's Jepsen Prairie Organics composting facility in Vacaville, California. About 10,000 tons of material go to Norcal's South Valley Organics site in Gilroy. Both facilities use the Ag-Bag enclosed aerated static pile composting system.

A number of articles in BioCycle have reported on the implementation and operation of San Francisco's program. The most recent article, "63 Percent Diversion and Rising" (February 2005), provides the latest information, including cost data and future expansion plans.

MACKINAC ISLAND, MICHIGAN

Started in 1992, Mackinac Island's source separated organics composting facility services a primarily seasonal population. Composting takes place in aerated concrete bays. Average materials flow is 5 tons/day. "We continue to improve our composting techniques, learning what constituents and analytes to check for to be sure we have a healthy compost," says Bruce Zimmerman, with the Mackinac Island Public Works Department.

All compost produced is sold to residents and businesses on the island, including hotels and golf courses. "Composting works really well for us," he adds. "The most important thing is to keep the raw material clean. We are in constant communication with residents and our commercial generators, and will reject loads if they come in contaminated."

HUTCHINSON, MINNESOTA

The city of Hutchinson has a 24-acre composting operation - called Creekside Soils - that is permitted to handle 1,782 tons of source separated organics, 8,460 tons per year of yard trimmings, and 9,360 tons/year of MSW transfer material. (See "Bagging and Blending Compost Products," June 2005 for a detailed update on this facility.) The Creekside composting facility receives curbside collected residential organics, which it composts in Green Mountain Technologies vessels. The city purchased the vessels used and contracted with Engineered Compost Systems to provide design engineering, start-up and training, and components for the aeration and process control and monitoring system.

In 2005, the city's Creekside Soils operation will sell more than \$1.6 million worth of compost and soil mixes, up from \$1.4 million in 2004. Creekside Soils is in its third year of processing about 25,000 tons of bagged, autumn leaves collected by the city of Minneapolis, 62 miles to the east. "We have done some fine-tuning of our (compost) bagging operation to make that more efficient," says Doug Johnson, facility manager. "We've got almost 600,000 bags on the ground, as of late October. We're ready to go for the early orders that come in; most of that will be delivered from February through June." The facility uses Premier Tech bagging equipment.

SWIFT COUNTY, MINNESOTA

Swift County started one of the first source separated composting projects in the U.S., with residents separating the compostable and recyclable fractions from the MSW stream. Operating since 1990, throughput at the plant is five to six tpd. Feedstocks are ground and composted in windrows. Finished compost is applied to county-owned lands and given away to residents.

WAYZATA, MINNESOTA

The City of Wayzata, located in Hennepin County, has been collecting residential organics since 2003. About 200 tons of food residuals have been collected. Residents set materials out in biodegradable bags. Organics are collected weekly; garbage is collected every other week, but residents can have it picked up weekly for an extra fee. Source separated organics are composted with yard trimmings at the NRG Processing Systems facility in Empire Township.

Recently, Hennepin County issued a Solicitation of Interest (SOI), to identify companies that might be interested in developing a source separated organics composting facility in the county. "The solicitation lays out the quantity of organics collected currently, and what we anticipate will be generated over the next five to ten years," says John Jaimez, of the Hennepin County Department of Environmental Services. Details about the SOI can be found at www.hennepin.us.

WESTERN LAKE SUPERIOR SANITARY DISTRICT, MINNESOTA

The North Shore of Lake Superior is considered one of the most precious assets not only of northern Minnesota, but all of North America. Protecting the water quality of the area is the mission of the Duluth, Minnesota-based Western Lake Superior Sanitary District (WLSSD). The district provides wastewater and solid waste services for a 530-square-mile service area in northeastern Minnesota, which includes the city of Duluth, as well as St. Louis and Carlton counties.

In 2001, WLSSD opened a source separated organics composting facility in Duluth, located on 12.5 acres of land adjacent to the District's wastewater treatment plant. The facility is permitted to handle 7,900 tons per year or 31 tons per operating day. This includes approximately 3,950 tons/year of source separated feedstock materials (SSFM) and approximately 3,950 tons/year of yard trimmings. Current yard trimmings flow at the collection site is about 31,200 cubic yards annually.

The bulk of organic residuals comes from large commercial and institutional generators. To service household diversion of source separated organics, WLSSD established several dropoff sites where residents can bring food scraps, including meat and dairy products, at no charge. "The food waste must be brought to us in compostable bags," says Susan Darley-Hill, WLSSD's environmental program coordinator. "We have bags available to give to residents at the dropoff sites and now they also are available for purchase at several retail outlets." Small businesses also are eligible to use the dropoff program. The amount received averages between a half to one ton/month.

The first drop-off site opened mid-2004. It is located at the yard trimmings composting site and is open to residents from spring through fall. During winter, the dropoff site is relocated to the District's household hazardous waste facility down the street from the composting site. The second site, established March 2005 at WLSSD's materials recovery center, is open year-round. In August 2005, a third dropoff location was established at a local hardware store to service residents and small businesses in the eastern portion of the District. "Food waste is received there one day a week," says Darley-Hill. "Right now, we have a 95 gallon cart behind the store. The other dropoff locations have a two cubic yard dumpster."

The District does not accept soiled paper or corrugated at the dropoff locations as a rule. However, users of its "waste free party kits" can drop off compostable serviceware, utensils, and napkins along with the food residuals they collect at special events. WLSSD lends 12-gallon rolling Norseman carts as part of the free party kit. Included with the kits are compostable liners, signage, cart labels, drop-site instructions, and a price list for compostable goods available at a local retailer. The district newsletter first featured the kits last spring, and they were in great demand for spring graduation parties and throughout the summer for family reunions and picnics.

In addition to the residential and small business organics, the composting site receives organic residuals from commercial generators and food processors (e.g., waste grains). The facility's tip/mix area, approximately 40 by 40 feet, is bounded on two sides by four-foot-high concrete push walls, which facilitate the loading and mixing operations. The surface is sloped to the composting pad to direct any runoff onto the pad and then into the holding pond.

Yard trimmings, used as a compost bulking agent, are stored north and west of the gated SSFM facility (north of the composting pad.) Finished compost, which has been screened and tested, is also stored in this area. Feedstocks are composted in positively aerated windrows, and are covered with a compost blanket or wood grinding covers, or with composted leaves. There are no tipping fees for source separated organics delivered to the mixing pad (excluding yard trimmings); leaves and small brush are free, with an \$8/cubic yard charge for larger diameter brush.

The quantity of source separated organics (excluding yard trimmings) delivered to the site doubled from 1,055 tons in 2003 to 2,200 tons in 2004, according to Heidi Ringhofer, WLSSD's Supervisor for Solid Waste Services. Composting equipment includes a John

Deere tractor and Schuler mixer, used in tandem. The mixer is powered by two sets of hydraulics for the discharge gate and the drag-out conveyor. The mixing auger is driven from a power take-off (PTO) shaft.

WLSSD markets its compost under the trademarked name, Garden Green®, "Compost you'll dig!"™. Residential users are the mainstay of WLSSD's compost marketing program, using about 90 percent of the material produced. They buy directly from the composting site in Duluth, in either 40-lb bags at \$4/ bag, or in bulk (\$20/yard self-loaded or \$25/yard loaded). On average, WLSSD plans to bag and sell a total of 5,000 bags of compost per year, with approximately 1,300 going to about a half-dozen local retailers and the remainder sold at the composting site. "We sell approximately 1,000 cubic yards of bulk compost at our yard waste site, annually," notes Ringhofer. "Two-thirds of the bulk is sold for the higher, loaded price, and one third to folks who shovel it up themselves. And for the first time this year, we sold bulk compost to a wholesaler for resale at his retail landscaping center."

The District is conducting a full-scale market study for current and prospective products in its Great Northern Green® line, Darley-Hill adds. "We do a significant amount of direct marketing at local special events, gardening workshops and community festivals. Mass marketing is accomplished through newspaper advertising and district newsletter articles. All of this is done in conjunction with our public education efforts to promote waste reduction, recycling, and higher-use objectives."

KING COUNTY, WASHINGTON

Four municipalities and one unincorporated area in King County, Washington have launched curbside collection programs for source separated residential organics, with support from the King County Department of Natural Resources Division of Solid Waste. About 63,000 households (in total) have weekly collection service available. The municipalities include Bellevue (23,355 households), Issaquah (2,714 households), Kirkland (10,132 households), Redmond (8,764 households). All food residuals, including meat and dairy, as well as soiled paper, are set out in carts, along with yard trimmings. "The number of households served does not reflect actual household participation," says Josh Marx, who oversees the source separated organics program for King County. "Depending on the jurisdiction, our estimates at this point are in the range of 10 to 25 percent participation. The big issue right now for these cities is how to get participation up and we are discussing some sort of consistent regional campaign for 2006."

Collection is done in a dedicated packer truck and sent to one of two composting facilities (Maple Valley or Everett, Washington), both owned and operated by Cedar Grove Composting. Cedar Grove processes all source separated organics in its GORE covered composting system. "The cost to customers in the cities is embedded with garbage rates," explains Marx. "In the unincorporated areas, yard waste and food collection is a subscription service. It is our hope that other cities in the county will negotiate with their haulers to add food/soiled paper in the near future as their contracts come up for renewal. In terms of overall reactions and insights (aside from participation), biodegradable bags are the big issue - how to make them cost-effective and consistently available for purchase, how to allow them without introducing confusion and thus contamination (e.g., with plastic grocery sacks), and of course their impact on product quality. What qualifies as biodegradable is determined by Cedar Grove, which has a list of approved biodegradable plastic products." Cedar Grove evaluates the degradability of all products within the parameters of its composting system. To view approved products, go to www.cedar-grove.com/customers/buy/Biobags.pdf.

SEATTLE, WASHINGTON

The city of Seattle adopted new recycling requirements recently, which prompted Seattle Public Utilities, the agency overseeing solid waste management, to roll-out a more extensive curbside collection program for residential organics. "The major changes to our residential curbside yard waste program were to include certain types of vegetative food scraps and food soiled paper, and the distribution of 90-gallon carts citywide to all curbside subscribers," says Gabriella Uhlar-Heffner of Seattle Public Utilities. "The carts are collected biweekly; subscribers can include yard trimmings, fruit and vegetable peelings, bread, pasta and grains, coffee grounds, and food soiled paper. Meat, fish and dairy products are not allowed. Extra yard trimmings can be put out in paper bags, but the food element has to go in the lidded cart."

About 97,500 of the 155,300 eligible household accounts were signed up for the program as of late October. "That is an increase of 4,900 accounts since the cart distribution started," she adds. "It represents a lot of households that were using the old program where they supplied their own 32-gallon cans for yard debris and not paying for it. Many residents have called about getting smaller sized carts, e.g., the 64-gallon, since the 90-

gallon carts are difficult to handle.”

Residents also have inquired about using biodegradable bags for the food scraps, but Cedar Grove, the composting company receiving the materials, does not want to see those introduced yet. “We advise residents to hold food scraps in their milk cartons as kitchen counter containers as a way to reduce the liquid in the curbside containers,” says Uhlar-Heffner.

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