In 1983, Carl Bolander and Sons, Inc., a Minnesota construction and demolition company, established SKB Environmental in St. Paul to function as its environmental arm, allowing cost-effective disposal and recycling alternatives for C&D debris. Over the years, SKB initiated recycling programs for the full range of construction and demolition materials, including wood residuals. Eventually, its services expanded to include yard trimmings management and mulch production, with a total of eight composting sites being opened in the Twin City region.

In July, 1999, SKB approached NRG Energy, Inc., a subsidiary of Xcel Energy, about obtaining the organic residuals from its Newport refuse derived fuel (RDF) plant. Discussions between SKB and NRG revealed that working together would help both companies. NRG would truck residues with high organic content from the RDF facility to the composting sites, which in turn would send NRG used plastic yard trimmings bags for RDF production.

Based in Minneapolis, NRG represents approximately 16,704 megawatts of capacity in independent power production through a number of fuel sources. The Newport plant, located close to Minneapolis, is a short distance from the SKB sites. In October, 2000, because of logistics and the potential for sustaining a total turnkey operation, NRG acquired the eight composting sites owned and operated by SKB, establishing NRG Processing Solutions (NRGPS). The purchase included SKB's waste contracts with haulers. "With the smaller size of SKB and some of the things that NRG wanted to do, it made more sense for NRG to take them over," says Kevin Tritz, co-owner of Specialized Environmental Technologies, Inc. (SET), the company that manages the composting sites, who formerly worked for SKB. "NRG also has more capability to secure waste."

The composting sites received a total of 257,000 cubic yards (cy) of yard trimmings and 47,000 cy of wood residuals from hundreds of generators last year. Three of the sites — Shakopee, Malcolm, and Anoka — accept yard trimmings, including leaves, grass and brush from both commercial haulers and residents. Lakeville and Cottage Grove accept the same materials from residents only. The Carver facility takes yard trimmings from commercial haulers, animal bedding and manure. The Empire site accepts yard trimmings and source separated food residuals from commercial, industrial and institutional sources. The composting sites produced an average of 60,000 cy of finished yard trimmings compost in 1999 and 2000, plus 2,000 cy of food residuals compost last year. All of the material made in 1999 has been sold. The gate price for compost is $8/cy.

Composting pads are constructed of crushed rock and concrete. Incoming feedstocks are ground by either a Vermeer tub grinder or a Peterson Pacific horizontal grinder, both of which are transported from site to site. "Yard waste is ground to about three to five inches in size and after screening, yields particles in the range of two to four inches," says Tritz. "We like to get the particle size small, but big enough to screen out plastics."

Ground material is placed in static piles, with moisture targeted at 40 to 50 percent. The piles are turned three to five times/year with a loader. Finished compost is taken down to a half-inch using either a CEC vibrating screen or a Re-Tech trommel, which like the grinders, are transported between sites. Compost is sold primarily in bulk. The product is guaranteed to contain less than three percent inerts.

**FOOD RESIDUALS METHOD**

SKB received a permit from the Minnesota Pollution Control Agency (MPCA) to process food residuals in 1995, but didn't take the first load of that feedstock at its Empire Township facility until September, 1998 (as part of a demonstration project). The Empire site is divided into two separate pro-

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There are no national records kept on waste volumes from residential demolition. Using the METRO example of 38 tons of recovery for one home, and applying it to the estimated 250,000 homes demolished each year in the United States (including those destroyed by Mother Nature), there is the potential to recover 10 million tons of material. This doesn’t even include waste from new construction and remodeling.

FINANCIAL OPPORTUNITY

North America’s construction industry has thrived over the past 20 years as economies have been strong and residential and commercial building has kept a record pace. More Americans live in homes today than at any time in history.

Two things are abundantly clear: residential construction and demolition waste is recoverable, and local governments have an enormous opportunity to divert millions of tons of marketable material from landfills and incinerators.

City governments control the building permits for the entire process and have the ability to induce significant recovery from construction and demolition. Their best option is to develop programs that make it easier for contractors to provide services versus providing actual recycling services themselves.

Engineers and architects can do their part by designing homes that can be disassembled during remodeling and demolition. This is already being done in Europe, where city buildings can be disassembled and recovered at the end of their useful life. And, of course, there are thousands of opportunities to add recycled content products to remodeling and new home construction projects.

North Americans have come a long way from the humble tepee to the conspicuous McMansion. Hundreds of thousands of homes are constructed and demolished each year. Imagine the financial coup for those willing to take on the challenge of tapping into the bountiful resources of home construction and demolition — a wealth of building materials that can be used again and again.

Peter Grogun is the manager of Market Development of Weyerhaeuser Recycling in Tacoma, Washington. The opinions expressed here are his own.
cessing areas — one for yard trimmings only and the other for composting yard trimmings and food residuals. A berm separates the two sides.

The composting pad on the food residuals side has a two-foot compacted clay overlay as required by the state, topped with another foot of recycled concrete. There also is a clay-lined surface water runoff retention pond. Ground yard trimmings and food residuals are combined in a Supreme mixing wagon in proportions that achieve a C:N ratio of 30:1. The mix is loaded by conveyor into CTI polyethylene composting bags (each with a capacity of approximately 200 tons). Aeration pipes are inserted into the bags as they are filled. After a nine to 12 week retention time, the bags are opened and the compost is moved to static piles for at least nine to 12 weeks of curing. The compost is then screened and taken to a storage area.

The used plastic bags are sent to the facility for use as RDF.

Hampered by transportation and source separation obstacles, only about 1,500 tons of food residuals were processed last year. The area permitted for food residuals, however, can handle 20,000 tons/year (half food and half yard trimmings). NRG is working with generators, including school districts, to increase the flow of food residuals. “There is some potential to get school districts on board by the fall of this year,” says Tritz. “We also had a state grant last year to educate manufacturers and industrial locations about how to set up source separation programs.”

Approximately 75 to 125 tons/day of organic residues are generated at the Newport facility. NRGPS has been doing composting research trials with the residues. “It appears that we can handle that material, composting it with yard trimmings in the bags in the same area where we are composting food waste,” says Tritz. “After composting, the material will be cured in static piles.”

MARKETS, EXPANSION

Roughly 50 percent of the compost produced (in total from all the sites) is sold in bulk to two bagging operations. Approximately 25 percent is sold to landscapers and nurseries, 15 percent to individuals and ten percent to the Minnesota Department of Transportation (DOT). “Last year, through different contractors, the DOT used over 10,000 yards of finished product from our sites,” adds Tritz. “Much of it gets
applied in the fall. They work it into
the soil and plant in those areas in
spring." Compost from the NRGPS fa-
cilities meets state requirements as a
Class 1 product — usable not only for
turf establishment, but also in food
growing applications. NRGPS is en-
rolled in the Seal of Testing Assurance
Program launched by the U.S. Com-
posting Council.
Reduced composting activity during
winter allowed SET staff to focus on
expanding and integrating the com-
posting facilities and RDF plant.
Procuring an adequate flow of organic
materials, including food residuals
and soiled paper and corrugated, is a
logistical challenge that SET plans to
tackle through construction of on-site
transfer stations. A permit application
has been submitted to the Minnesota
Pollution Control Agency for the first
transfer station, which would take 150
tons/day or greater of mixed waste.
The plan is to locate it at the Empire
Township site. Source separated loads
would arrive in bags — preferably
biodegradable — and be sent directly
to composting. Mixed loads would pass
through a picking station (another op-
portunity to remove organic residuals)
located between the tipping floor and
the shredder. Separated rejects would
be sent to the Newport facility for
RDF. The site has the space to process
the increased flow of feedstocks.
Although most of the area’s waste
goes to out-of-state landfills, Min-
nesota is considering a regulation
that would require all waste to be pro-
cessed for recycling and/or energy re-
covery before going to the landfill. It
would take effect in 2008, which
would heighten the importance of di-
verting organic residuals to compost-
ing. “If that holds, there wouldn’t be
enough burn capacity,” says Tritz.
“We’re planning for several years
down the road.”
Another organic recycling business
is being added to the NRGPS family —
Tree Cycle, owned by NRG’s parent
company, Xcel Energy, Inc. Tree Cycle
locations process tree trimmings gen-
erated by crews maintaining power
line areas. With mulch volumes less-
ened by the use of wood chips in com-
posting, acquiring Tree Cycle will en-
hance NRGPS’ mulch product line and
add the use of two grinders. Mulch
prices range from $2 to $20/cy, de-
pending on variables such as number
of grinds and screening size. NRG col-
orized some mulch last year on an ex-
perimental basis and will expand that
this year with wood from pallets and
construction and demolition debris.
“We’ll probably handle in excess of
50,000 cy of tree mulch this year,” says
Tritz, “marketing it to residents, retail
outlets, landscapers and nurseries.”