The Timpanogos Special Service District in Utah upgraded its composting facility last summer primarily to improve its process and odor control. The upgrade included switching to a covered aerated static pile system and purchasing a windrow turner.

BIOCYCLE NATIONWIDE SURVEY

PROFILES IN BIOSOLIDS COMPOSTING SUCCESS

National survey continues with a "tour" around the country of new and existing composting operations that have one common theme — high demand for the finished compost.

Part II

Nora Goldstein and Ned Beecher

A LONG-TERM "exchange" between the City of Ishpeming, Michigan and a local landfill to trade biosolids for disposal with landfill leachate for treatment came to an end in 2010. Ishpeming was faced with having to find a new biosolids management option. "Our Board had always wanted to go to Class A treatment of the city's biosolids even though we had a good deal with the landfill," says Deborah Pellow, director of the city's WWTP. "We had evaluated a number of dryers but the cost to operate one were astronomical." A consultant was hired to evaluate options and the recommendation was to pursue in-vessel composting. "We are faced with severe winters in the Upper Peninsula of Michigan, so windrows were not an option," she adds.

Ultimately, the city and its consultant decided to purchase the stationary vessel technology from Engineered Compost Systems. The treatment plant generates about 2,000 wet tons/year of biosolids. Five vessels (14-ft wide by 58-ft long) were installed. Wood chips, ground to about 4-inches, are purchased for $30/ton from a local processor (wood is in abundant supply in the region). Ishpeming purchased a truck-mounted Kuhn-Knight mixer with a scale on it. "The operators put a set amount of wood chips into the mixer and then drive under the conveyor from the belt press, and add in a specified amount of biosolids," says Pellow. "The materials are mixed and then unloaded in front of the vessels, where an operator uses a loader to put them into a container." Material is composted for about 50 days, and then is screened in a Screen USA trommel with three-eighth-inch holes. Screened wood chips are recycled back into the raw feedstock mix. The compost is sold for $15/pickup load (about 1-1.5 cubic yards (cy)).

The investment in the biosolids composting facility was about $1.5 million, including the vessels, aeration system and computer controls, and the mixer and screen. "The biggest operating cost is the wood chip amendment," adds Pellow. "We've calculated, based on wood chips alone, that our cost to compost one vessel full of biosolids is $1,704.90, whereas the cost to us to landfill that equivalent amount is $3,420.50. That is just based on the tipping fee. Having the operators here, whether they are driving to the landfill or driving the mixing truck, time, gas, etc., is all pretty much of a wash. We are just comparing the actual disposal cost versus the actual amendment cost. Plus, we generate a product that we can sell."

TIMPANOGOS SPECIAL SERVICE DISTRICT (TSSD), AMERICAN FORK, UTAH

The Timpanogos Special Service District (TSSD) in American Fork, Utah, has been composting biosolids from its wastewater treatment plant since 1994. For many years, the biosolids were thickened on drying beds, and then combined with a bulking agent and composted in open-air windrows. A plant expansion from 18 million gallons/day (mgd) to 30 mgd led TSSD to "abandon" the drying beds and switch to mechanical dewatering with polymer. "That really increased the odor of the biosolids," says Jon Adams, TSSD's District Manager. "Over the years, the land around the treatment plant has been developed, especially when a freeway interchange was built right here. There has been significant encroachment on our treatment plant borders. And one of the first businesses to open nearby was a luxury car dealership!"

TSSD researched several composting options, included covered aerated static piles. A full-scale pilot using TSSD's biosolids was conducted at a covered composting facility at another

treatment plant. "We were pleased with the results of the trial, and issued an RFP for a covered aerated static pile composting system," says Adams. "Three or four companies responded and we selected the GORE Cover System. The company had installations in cold climates, such as Moncton, New Brunswick, which gave our Board a higher comfort level." Construction of the system on the former drying beds began last spring, and the facility began operating in late summer 2010. TSSD also purchased a Scarab windrow turner; it already owned a Duratech grinder to process yard trimmings dropped off by citizens, as well as pallets and other wood waste brought in by area businesses. "We use about 25,000 cy/year of green waste as amendment," he adds.

About 3,500 to 4,000 dry tons/year of biosolids are generated by TSSD. While the District probably could have gotten by with 12 to 15 GORE covers, it opted to purchase 24 to ensure there was adequate covered composting capacity available. Biosolids and bulking agent are mixed with the Scarab, and then the piles stay under cover for four weeks. They are uncovered, moved and turned, and the material is composted for an additional two weeks (under aeration but not covered) before going to a curing area. Finished compost is screened in a Wildcat trommel. "We have always had great acceptance of our finished compost, which we sell for $20/cy," says Adams. "Our residents and area landscapers love the product, and we often are sold out. We also furnish compost to the cities that send their wastewater here for treatment. They use the compost in parks and on city-owned properties. Some cities also make it available to the public."

A few challenges have been encountered, mostly because of an unusual amount of rain starting in November, and then below average temperatures this winter. "We've had drainage issues on the former drying beds — not where the concrete pads and aeration were installed, but around them," he explains. "We are making some modifications to the site to improve the drainage. We were prepared for the cold temperatures — the composting is working well — but we need the weather to warm up so we can address the drainage. We are still learning how to optimize operations, but the odors are definitely under control, which was a major goal for the District."

Capital costs — which include the GORE covers and roller, turner, site engineering and construction — were $5.2 million. Operating costs are expected to be about $900,000/year, which are offset by $350,000 to $400,000/year in revenues from compost sales. "If we had decided to not compost the biosolids and instead take them off-site to a nearby landfill, the annual operating costs would have been about $1.3 million, including tipping fees and trucking," says Adams. "In addition, we would have needed to purchase the trucks. Switching from windrow composting to the covered system also enabled us to eliminate having workers here on a night shift, which was necessary to keep up with mixing the biosolids and amendment and turning the piles. We no longer have those overtime expenses. Finally, staying with composting means residents have a free place to drop off their yard trimmings, and we still have compost to sell!"

FACILITY SNAPSHOTS

Fairbanks, Alaska: "Fairbanks wastewater plant's compost garden is wildly successful." That was the headline in an August 2010 edition of the *Daily News Miner*, interior Alaska's major newspaper. The story showed, in words and pictures, a lush garden of flowers and vegetables "amid the heavy equipment and industrial setting of the Golden Heart Utilities wastewater treatment plant." The garden, new in 2010, provided huge cabbages, abundant tomatoes, and other produce for utility employees. High demand from residents and landscaping companies leads to rapid sales at $5.00/cy.

In operation since 1997, the composting plant uses aerated static piles and wood chips as an amendment for the 1,525 dry tons of wastewater solids processed each year. The cold winters require some special added measures — compost piles are built larger, are covered with 2-feet of finished compost for insulation, and are aerated less. It's "a true success story for the arctic," as the Utilities' website proclaims.

Lee County, Florida: Located in Ft. Meyers, the Lee County biosolids composting facility opened in December 2009, processing 2,850 dry tons/year of biosolids with mulched yard trimmings. Materials are composted in windrows turned with Backhus equipment to meet Part 503 requirements. The compost is marketed as OrganicLee and sells for $2 a bag or in bulk for $20/cy. Keith Howard, Deputy Director of the Lee County Solid Waste Division, reports that the operation is going well. He is especially pleased with the simple, low-cost solution employed to protect the compost windrows from rain and thus better control compost quality, while controlling runoff: six 16,000 sq. ft. fabric structures.

Davenport, Iowa: Since it opened in May 1995, the city of Davenport's biosolids composting facility has diverted over 500,000 cy of biosolids and 1.4 million cy of yard trimmings from landfills. Using aerated static piles inside a building, Davenport processes 5,500 dry tons/year of biosolids into "Earth Cycle" compost that is sold in bulk ($5-$10/cy) and bags (1 cu. ft. for $1.50) around the "Quad City" area. Years of experience have made city staff highly knowledgeable and experienced with compost quality and uses, including for erosion control, filter socks, berms, landscaping, topdressing, athletic field restoration and other applications. And its website includes this boast: the Iowa State Fair record pumpkin in 2007 — all 1,176 pounds of it — was grown with Earth Cycle compost. "At times it was growing over 40 pounds/day," reports the city.

The West Warwick, Rhode Island biosolids composting facility closed last year after its site was flooded and the equipment ruined.

Havre de Grace, Maryland: This Chesapeake Bay community of 12,000 at the mouth of the Susquehanna River has composted biosolids from the local 3.3 mgd (design capacity) wastewater treatment plant since 1986. Aerated static pile composting with wood chips treats most of the 1,300 wet tons (230 dry tons) of solids produced annually, although some is directly land applied (300 wet tons) and some is landfilled (190 wet tons). Facility manager James Gill says some of the compost is given away to local residents, while some is sold for $7.00/cy. Recent changes include an upgrade to centrifuge dewatering, resulting in drier cake, and a switch to use of ground wood as a bulking agent. The ground wood costs less than the wood chips the facility had been using and is "about the same" in terms of how they work, according to Gill. The increasing cost of carbon-rich amendments is a concern expressed by many biosolids composters.

Lebanon, New Hampshire: When we published Part I of this national survey of biosolids composting in the December 2010 issue, we knew there were some gaps and errors in our data, and requested corrections and updates. We heard from an old friend in Lebanon that biosolids composting is thriving once again in the busy Connecticut Upper Valley region where, years ago, Dartmouth College and the Town of Hanover had pioneered a progressive in-vessel system for composting both biosolids and college and restaurant food waste. That facility closed a decade ago. Two years ago, Lebanon, next door to the south, started composting its biosolids in windrows at the local landfill site.

The operation is managed by former New Hampshire Department of Environmental Services compost expert Marc Morgan, now Solid Waste Manager for the City of Lebanon. The 2,000 wet tons (~400 dry tons)/year of Lebanon wastewater solids are mixed with high carbon wood ash, food waste (20 wet tons a month), and leaves and yard trimmings. Finished compost is used on the landfill for erosion control and vegetation growth. "We do have plans to create a marketable product," notes Morgan, "but for now we can use it all right here; instead of topsoil."

Reviewing the program's progress, Morgan notes: "It started slow and it's picking up. The product gets better every year as staff's knowledge increases. Hanover will be bringing their biosolids here for composting in February. That will add about 1,000 [wet] tons more to our composting program."

(Updates were received from several other projects listed in Part I of this Survey Report: The Ocean County, New Jersey Utilities Authority does not compost its biosolids but instead uses a dryer, producing about 9,000 tons/year of fertilizer. In Virginia, the Livingston and Spotsylvania County composting sites are listed separately; they are the same operation.)

West Warwick and Bristol, Rhode Island: At the beginning of 2010, there were two long-running biosolids composting facilities in Rhode Island in the towns of Bristol and West Warwick. But April's "Great Flood of 2010," as the *Providence Journal* dubbed it, covered the West Warwick composting site and the neighboring wastewater treatment plant in 6 feet of water. With equipment ruined, a strong trend in the state to incinerate sewage sludge, and little state support for beneficial use, the operators decided not to rebuild the composting operation.

This leaves Bristol, a town of 23,000 on the east shore of Narragansett Bay, as the only biosolids composting operation in the Ocean State. In operation since 1992, Bristol currently uses Siemens-IPS in-vessel technology consisting of four enclosed 220-foot bays with five independent aeration zones and a mechanical turner. Undigested wastewater solids from belt filter presses (25% solids) are combined with shredded yard trimmings to make the compost, which is given away to residents and sold to landscapers.

In 2008, Bristol tested the concept of engineered biodrying, which involved maximizing removal of moisture from composting unamended biosolids. In one trial, a blend of Bristol cake and heat-dried pelleted biosolids went from 43 percent solids to 88 percent over 24 days — but pathogen reduction was not achieved. A second trial balancing pathogen reduction and biodrying yielded a compost with solids content of 68 percent after 18 days.

Grand Strand and Kingstree, South Carolina: Grand Strand Water and Sewer Authority (GSWSA) operates eight wastewater treatment facilities in and around Myrtle Beach, South Carolina, the "#1 beach and sun destination in the United States," according to TripAdvisor, and a golfer's paradise. Biosolids from GSWSA's Myrtle Beach 22.4 mgd (design capacity) treatment plant have, for many years, been land applied to farms or composted in aerated static piles with hardwood chips. The compost is used on commercial and residential lawns and gardens. Manager Perry Shelley notes that GSWSA will soon be starting up a regional composting facility to take biosolids from some of its other area wastewater treatment plants.

According to the state's biosolids coordinator, Brenda Anderson Green, Grand Strand is bucking the tide: most of the state's biosolids composting facilities have closed over the past 10 years, including Aiken County/Horse Creek, Florence, Hilton Head and Kiawah Island. However, a private regional facility, Williamsburg Recycling, currently composts1,600 dry tons/year of biosolids from the Town of Kingstree. The in-vessel operation started in 2008 and plans to expand and take more material from other area plants in the future. "There is also one pilot project in the state trying vermicomposting," says. Green, "but I don't know if that will lead to an operating facility." ■