

## **OPERATIONAL CHALLENGES ASSOCIATED WITH A COMPOSTING FACILITY AT THE HIGHEST ELEVATION IN THE EAST**

By

**Robert M. Heaton**  
Town of Beech Mountain  
Beech Mountain, North Carolina

**F. M. Pittman**  
North Carolina Cooperative Extension Service  
Newland, North Carolina

The Town of Beech Mountain provides water and wastewater services to approximately 1800 connections. The town is located in the northwest mountains of North Carolina at an elevation of 5500 feet. Beech Mountain is a summer and winter resort community, with Ski Beech ski resort and the Beech Mountain golf club beginning two of the largest attraction. With a full time population of 263 and a winter and summer increase of almost 10000 operation challenges are a constant.

Composting began in 1990 when the town could no longer send biosoilds to the landfill. After looking at land application, and finding no sites the could be permitted due to the mountainous terrain, and the fact that we had a program for collecting wood chips and yard waste made composting a viable choice for reuse. The operation is comprised of a 200' by 200' asphalt pad with a 200 cfm blower, from a old treatment plant, located next to the Pond Creek wastewater plant. All of the construction was done by the town employees. The facility is permitted for 8 dry tons of biosoilds per year, and has produced a high quality product.

With a town elevation of 5500' and a facility elevation of 3720', what are some of the operation challenges we face? Most are weather related, at this elevation there are 4 true seasons. In the winter you see cold temperatures, rain snow and ice. In spring you have rain, summer warm temperatures, and heavy storms. During the fall things are usually calm. The other challenges are managing product, and finding technical support. How do we deal with these challenges and still produce a quality product?

### **TEMPERATURE**

With heat a major component of the composting process, low air temperatures cause a problem in the treatment of the compost. Beech Mountain uses the "Aerated Static pile" process, on an open pad. Without a cover to protect the process one of the ways we have found to keep temperatures above 55 C. in the winter is to cover the pile with a top layer of wood chips. This is an operational procedure that is done with compost that is mixed in the late fall. Compost is only mixed 3-4 times per year, due to the variations in flow we receive, in May, July, October, and November. This extra cover acts as an insulating blanket to keep the mix warm. One of the problems associated with this is you must use extra long probes to get good temperature readings. The reason for extra length is for not only for the layer of chips, but the fact that Beech Mountain averages approximately 60" of snow per year, and during the past 3 year we have averaged over 100". The snow in some ways helps the process, by insulating the pile and adding moisture to the mix as it melts. This procedure has worked so far and we have been able to see mix temperatures maintain an average of 60 C. during the mix cycle. The use of extra cover is only possible because of the stockpile of bulk material we have. During the summer months one 4 - man crew dose right-a-way clearing, and per town ordnance all yard waste is picked up once each week and brought to the compost facility. These pickups allow us to create a very large stockpile of bulk material for future use.

### **RAINFALL**

Rain and snow may be the greatest operational challenges for this facility. With an average of 54" of rain per year, and 60" of snow, storms and run off can cause major problems. The worse beginning a combination of a 30" snow and a rain event on top of that or a tropical system that makes it to the mountains. During the past 5 years there

have been 3 such events. These storms create two separate problems. 1) With outfalls that begin at 5500' and drop to 3700' in a distance of about 5 miles and the associated I & I problems the influx of water hydraulics the waste system, 2) the facility sets at a bend on the stream itself which can be a flood hazard. In two of the storms water cut out of the stream channel cut across the compost bulk storage and destroyed about half of the compost pad, it then traveled through the lab/blower building and across the wastewater plant. With the drainage from the pad going into the plant this only made the damage to the plant worse. Within 3 months the wastewater plant was shut down and the shaft in the clarifier mixer replaced, along with the drive unit.

Planning is the only way to manage these situations, and sometimes that is not very effective. You must plan when you waste from the plant so that you are mixing compost in the times that it is less likely to be affected by these weather events. The normal procedure is to waste in late March, June, August, and October. This will give the solids time to dry on the beds to about 35 - 39 % moisture, at which point it can be mixed at a ratio 3 parts bulk to 1 part biosolids. In planning to do most operations in this way the facility is clear of any product that could be harmed.

## **MANAGING PRODUCT**

One of the concerns of starting the compost facility was what to do with the finished product. After mixing at the 3:1 ratio you end up with about 40 tons of product, and possibility 50 tons. The original plans called for placement of all compost on road cuts made by the town developers, with 60 miles of roads this gave a good outlet for the product. Since that time we have found other outlets for this product, such as corner flower gardens, and business and homeowners. The very low metals content and the ability of the process to meet pathogen requirements has also allowed it to be used in some of the roadside overlooks and parks. With so many new ways to use compost, and a very good acceptance by the residents and visitors, the town has not only been able to reuse a waste byproduct, but do so in a way that is cost effective and enhances the natural surroundings.

## **HOW HAS LOCAL COOPERATIVE EXTENSION PROVIDED SUPPORT**

One of the problems Beech Mountain faced in 1990 when it could no longer landfill biosolids was "What do we do now". Land application was not an option due to the fact there were no suitable sites, and the cost to transport somewhere else would be prohibitive. This where North Carolina Cooperative Extension stepped in, F. M. Pittman from the Avery County office and Dr. A. R. Rubin from North Carolina State provided several forms of assistance, and that assistance is ongoing not only with Beech Mountain but with other municipalities in Avery County.

Cooperative Extension support includes;

- 1) 'Feasibility Assessment' of the biosolids facility, by examining the feasibility of alternative management practices, whether it is land application, composting, or lime stabilization.
- 2) 'Ad - hoc Technical Assistance' by developing solutions to technical problems caused by seasonal fluctuations in population.
- 3) 'Information Dissemination' by conducting annual meetings to discuss technical, regulatory and public relation issues.
- 4) 'Other Forms of Assistance' by conducting biosolids testing and keeping the up - to - date on environmental regulations.

The assistance provided by Cooperative Extension has improved the biosolids management capabilities, practices, and performance of the municipal facilities. They have helped the town to find quality information, and make informed choices about beneficial reuse. The cooperation and continued work with the extension agents will further improve management practices, save the town money, and produce a safe high quality product that is used in the community.

## **DOES COMPOSTING IN THE MOUNTAINS WORK**

Even with all the problems Beech Mountain faces from weather, to technical problems, to management of product, composting can be done and a quality product produced. With the hard work of the Beech Mountain staff, the North Carolina Cooperative, and the acceptance of the public, Beech Mountain has been able to take what was a waste product and turned it into a recycled beautification product that can help promote the natural surroundings of this resort community.