PATHOGEN RESEARCH OF DEER CARCASS COMPOST FACILITIES LEADS TO GREATER ACCEPTANCE OF PRACTICE

The research that set out to study pathogen breakdown in deer compost piles resulted in better than expected outcomes. Thorough pathogen reduction within four months of active composting and a valuable end product that can pass stringent compost requirements after one year.

NYSDOT, through its research conducted by Cornell’s Waste Management Institute (CWMI), has gained a new environmentally beneficial and cost efficient road kill disposal option. In NYS, state regulatory agencies are allowing expanded use of the practice to include any road killed animal: raccoons, skunk, bear, etc. An exception to composting is placed in areas where Chronic Wasting Disease was identified in 2005, although future studies may prove that even in regard to prions, composting may play its role, potentially by reducing carcass volume and acting as a stabilizing medium prior to final disposal.

By 2003, NYSDOT had established deer composting piles across the State. Although NYSDOT published a manual for facilities wishing to start their own composting piles, agency officials recognize the need to prove that the process is safe for workers and that the final compost product can be used in the highway environment. DEC Region 3 officials determined that deer composting could continue as long as workers follow the NYSDOT manual and no end products are used in the highway right-of-way until DEC grants approval.

In 2005, NYSDOT funded a research project to study the breakdown of pathogens in deer composting piles to ensure environmental and worker safety. CWMI and scientists from various specialties identified the following indicator pathogens for study: salmonella, fecal coliform including E coli, fecal streptococci, enterococci, and mycobacterium avium paratuberculosis. These particular organisms were chosen by virtue of relative hardiness and whether they behave like other related pathogens that would be found in wild deer. Laboratory and sampling logistics also had to be taken into consideration. Due to the high cost involved in researching the breakdown of prions during composting, that study had to be excluded from the current research agenda. A literature search was conducted on the (Continued on Page 2)
prevalence of pathogens in New York State’s wildlife population and conditions associated with their inactivation. An executive summary will be published.

The CWMI team set up research piles at the Ithaca campus of Cornell and at assorted NYS-DOT facilities across the State. Team members Ellen Harrison, Jean Bonhotal and Mary Schwarz brought years of experience from composting on farms. In addition to the research, their work includes reaching out to highway departments to consider adopting the practice, sharing research results and training. There is a lot of hands-on involvement in order to overcome the reluctance to composting carcasses due to concerns over odors, scavengers and general misconceptions. Usually, all ill-perceived notions are laid to rest after a demonstration and training workshop.

NYSDOT has several options for using the compost product, which is considered mature after one year. Prior to full maturation, it can be used as a base for new compost piles. One year old compost is well suited for use in low public contact areas along the roadways. Some roadsides have been beautified by establishing grass on a layer of compost. At others sites, it has been used as a base for shrub plantings. The compost itself does not contain seeds and therefore, grass can establish without pressures from competing weeds. Compost also has remarkable qualities that are a great fit in erosion control applications. Compost can maintain its composure on steep slopes and in the face of heavy downpours. The erosion control industry is aware of these features and is seeking commercial outlets for the many different types of composts available today. At DOT, due to the regrettable but ample supply of wildlife mortalities, free availability of woodchips from tree cutting operations and the dedication and willingness of highway professionals to manage compost piles, the compost is available for end use within the highway environment after one year.

For additional information on this project please contact Elisabeth Kolb ekolb@dot.state.ny.us

**SMART INFRARED INSPECTION SYSTEM: TRANSPORTATION R&D AT NYSERDA**

Large and medium commercial trucks travel more than 200 billion miles each year and consume more than 40 billion gallons of fuel. Commercial truck traffic has grown at rates that surpass all other forms of highway transportation. A number of federal and state agencies, including the New York State Department of Transportation, are concerned with minimizing the impacts of commercial traffic in terms of energy consumption, environmental impacts, infrastructure wear and tear, and overall highway safety. Through its federally funded motor carrier safety program, New York State conducts more than 100,000 commercial vehicle in-
spections each year. The current process for inspections in NYS requires an even larger number of trucks – at least 5 times as many – to slow to enter an inspection site, to wait in a queue, and ultimately to be released back to the highway, often without undergoing an actual safety inspection or credential review. This additional time spent in this process consumes on average an additional 0.5 gallon of fuel and has been estimated to cost motor carrier operators as much as $5 per stop in added operational expense.

The Office of Safety and Security Services at NYSDOT is evaluating new technologies for pre-screening vehicles as a means for focusing limited resources on those vehicles most likely to present a safety related issue. Many studies have demonstrated that thermal imaging of vehicles can effectively identify vehicles that have problems with brakes, wheel bearings, and tires. Statistically, data confirms that vehicles with at least one brake violation will often have other serious safety violations as well. While thermal imaging has been known to effectively screen vehicles, it has not been widely adopted.

Increasingly, New York and other states are becoming more interested in conducting their pre-screening efforts on the mainline stretches of Interstate highways. A number of wireless inspection technologies are under investigation in New York, including virtual weigh stations using remotely accessed Weigh-in-Motion (WIM) devices and advanced 5.9GHz dedicated short range communication based Vehicle Infrastructure Integration (VII) systems where vehicles interact directly with roadside sensors and other communication systems. The addition of thermal imaging to these main line pre-screening system is a logical extension of the current state of technology.

With financial assistance from the Federal Motor Carrier Safety Administration and the New York State Energy Research and Development Authority (NYSERDA), International Electronic Machines (IEM) Corporation of Albany, NY is working closely with NYSDOT to develop and demonstrate a Smart Infrared Inspection System (SIRIS) that could be deployed at inspection locations in New York State. SIRIS uses smart image processing combined with an expert system to automatically detect and evaluate thermal signature and to report potential problem vehicles to inspectors. A primary goal of the research and development project is to develop a new infrared sensor capable of capturing thermal images from vehicles traveling faster than 40 mph and perhaps in excess of 60 mph.

For more information, contact: Joe Tario  862-1090 ext 3215  jdt@nyserda.org
GEOTEchnical Engineering Environmental Monitoring

In 2003, the Subsurface Exploration Section of the Geotechnical Engineering Bureau began to perform subsurface environmental investigations at the request of Regional Environmental Coordinators. The first project was the former Binghamton Equipment Management Facility. At this site exploratory borings and monitoring wells were progressed to collect data necessary for the proposed transfer of the property as a brown field site.

The exploratory borings were initially installed using a drill rig that is normally used to obtain soil and rock samples for foundation engineering design purposes. Although effective, this resulted in the accumulation of a significant volume of contaminated soil requiring disposal, and the grouting of the four inch diameter sampling hole. More recently the Bureau purchased and installed a geo-probe hammer on one of our former drill rigs. This is a vibratory percussion hammer that progresses a small diameter hole by displacing the soil. Samples are obtained ahead of the probe. Minimal soil is brought to the surface greatly reducing the amount of contaminated material handled and the volume of grout required to seal the boring.

Following this pilot project, the Subsurface Exploration Section has performed approximately ten environmental investigations using this new equipment. Upon request for an investigation and the receipt of a site history and drawings depicting the location of the former underground storage tanks, a site inspection is held with regional personnel; the environmental coordinator, and the resident engineer or representative.

The next step is for the geologist to plan the investigation. The intent is to determine the location of the highest concentration of contaminants both laterally and vertically. Petroleum products lie at or near the groundwater table. Soil samples are obtained as the exploration is progressed. Each sample is screened with a photo ionization detector which roughly measures the level of volatile organic compounds. Those samples with the highest levels are placed in containers, sealed, and brought to an approved laboratory for analysis. The analysis consists of measuring for the presence of approximately sixteen chemical constituents. The primary components are benzene, toluene, ethylene, and xylene. These are commonly called BTEX.

We have investigated the bioremediation of several sites that are being monitored. Because the natural degradation of the petroleum contaminants is a slow process, we have used a process called bio-augmentation. In this process, the site is inoculated, through geo-probe holes, with high concentrations of specific hydrocarbon degrading materials to augment the natural degradation that takes place. The initial application was completed in the fall of 2006.

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We have also worked with the tire shred embankment sites, installing monitoring wells prior to construction. A baseline of ground water conditions is established. Once the tire shred embankment has been constructed, the ground water monitoring continues to detect differences that may occur. To date monitoring wells have been installed at five sites.

At PCB sites, our work is by US Environmental Protection Agency mandate to monitor groundwater quality at two temporary disposal sites for PCB contaminated canal dredge spoil. Groundwater samples are collected at each site bi-annually. A yearly report is submitted to the Environmental Analysis Bureau and is included as part of their report to the US EPA.

Additional information regarding this program can be obtained by contacting Steve Heiser at sheiser@dot.state.ny.us

INTRODUCTION FROM THE DEPARTMENT'S LIBRARIAN, JANE MINOTTI

I am very excited to begin serving as the Librarian of the Department’s Research Library. I look forward to providing employees with the informational services they rely on. The Library is the agency’s local point of contact for resources on transportation. The 30,000 volume collection includes technical reports, weekly and monthly trade magazines and journals, and AASHTO and Transportation Research Board publications. We participate in the NYS Library’s efficient Inter-library Loan service to provide materials which are not available here, and we perform literature searches utilizing specialized data bases.

Prior to coming to DOT, I served as Director of the Sand Lake Town Library in Rensselaer County and as Librarian to the Counsel’s Office of the Office of Mental Retardation and Developmental Disabilities. In my spare time, I enjoy browsing in yarn stores, knitting, reading, and spending time being outdoors.

The Library is open every day from 8 AM – 4:10 PM on the Third Floor (North Side), POD 34. For information or requests, I can be reached at 485-2077 or ResearchLibrary@dot.state.ny.us. Please feel welcome to stop by the Library and introduce yourself!