

NORTH CAROLINA
GOVERNOR'S AWARD
19  **99**
FOR EXCELLENCE IN
WASTE REDUCTION

Presented By
N.C. Department of Environment and Natural Resources
Division of Pollution Prevention and Environmental Assistance

waste
reduction

- sustainable purchasing
- environmental compliance
- efficient transportation
- sustainable land management
- smart growth partners
- sustainable property management
- sustainable materials management
- energy efficiency
- sustainable natural resource management
- source reduction
- sustainable buildings
- sustainable agriculture
- sustainable forestry
- employee recognition
- recycling
- environmental compliance

Governor's Award for Excellence in waste reduction

This is the 19th year of the Governor's Award for Excellence in Waste Reduction. It is the nation's oldest state pollution prevention award. Governor James B. Hunt Jr. began the program during his first term as governor in 1981 as an effort toward environmental sustainability.

This waste reduction award recognizes North Carolina industries and government agencies and institutions for their accomplishments in reducing, eliminating and managing their wastes by using innovative source reduction methods, reuse, and recycling programs and energy recovery systems.

These annual awards are presented for six categories of organizations: large business, medium business, small business, federal facility, state agency, and local government. Three levels of awards are presented:

Outstanding Achievement (highest award)
Significant Achievement
Exceptional Steward

This program is important because North Carolina organizations invest significant time and resources in protecting the environment. These efforts often are unrecognized. These awards honor those organizations in North Carolina that have shown outstanding commitment to preserve natural resources and protect the environment and public health. Winners find the proactive environmental actions they take contribute as much to North Carolina's economy as well as its environment.

message from Governor Hunt



For the past 19 years, the Governor's Award for Excellence in Waste Reduction has recognized North Carolina businesses and industries that demonstrate excellence in eliminating, reducing, and managing waste. I created this award during my first term as Governor to honor businesses and government agencies and institutions for their commitment to protect the environment and public health through pollution prevention programs. The award recognizes those who have looked at their daily business operations and the negative impacts their operations have on the environment and have decided to do something about them.

The Earth's atmosphere and climate are being affected by our actions in ways unknown to us just a few decades ago. We must realize our oceans are facing unprecedented stress, and the rich biodiversity of our planet is slipping away at an accelerating pace. We must see ourselves as stewards of our planet, passing on to new generations a legacy, not a burden.

You are taking responsibility and are part of the movement to create a more sustainable partnership between the human community and the rest of life on planet Earth. Your accomplishments show that environmental sustainability can be good for business as well as the economy.

My congratulations to all of you for your hard work in protecting our precious environment and preserving our bountiful natural resources. Together, we can make a difference.

My warmest personal regards.

Sincerely,

A handwritten signature in black ink, which appears to read "James B. Hunt Jr." The signature is fluid and cursive.

James B. Hunt Jr.
Governor, State of North Carolina

panel of judges

The criteria for judging entries for the awards program includes environmental and economic benefits, technological innovation, commitment by management, and leadership in communicating awareness to others.

A panel of four judges, representing various interests, extensively review applications and recommend award recipients to the Governor for approval.

Judges selected for this year's award include two 1998 Governor's Award for Excellence in Waste Reduction winners, a waste reduction expert, and a local government representative.

Kathleen Gray

Environmental Resource Program, UNC-CH
Chapel Hill, North Carolina

Leon Holt

Town of Cary
Cary, N.C.

Rick Jackson

Brown Creek Correctional Center
Polkton, N.C.

Charles J. Rowe

Commscope
Catawba, N.C.

achievement

outstanding

large business	Konica Manufacturing USA, Inc.	page 6
medium business	Louisiana-Pacific Corporation	page 7
small business	EMJ America, Inc.	page 8
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Did you know . . . It takes 66,000 gallons of water a year to make your daily newspaper.

outstanding achievement large business

Konica Manufacturing USA, Inc.

Location:
Whitsett
(Guilford County)

Activity:
Photographic paper

Pollution Prevention Application:
Source reduction, reuse, and
recycling, water conservation

Reduction:
Not calculated

Annual Savings:
\$166,344

Contact:
John Moore
Environmental Engineer
336.449.8000, ext. 308

Background. Konica Manufacturing USA Inc.'s Whitsett plant manufactures high-quality photographic paper. The facility currently has approximately 350 employees and operates 24 hours a day, seven days a week. In 1998, Konica obtained certification of its ISO 14001 environmental management system. Through this environmental management system, Konica has established goals to prevent pollution, comply with environmental regulations, and continually improve its environmental performance.

Waste Reduction Activities. Konica has implemented several programs to reduce and recycle many of its solid waste streams. These activities include collection of some uncoated paper to supply markets that convert paper/plastic mixes into packaging corner boards; collection of coated paper to supply markets for its silver constituency; collection of vinyl roll wrap scraps to supply markets for use in smaller applications; recovery and reuse of barrier bags used to ship products to customers; collection of bulk bags and drums to return to raw material suppliers; and collection of cardboard, paperboard tubes, and pallets for recycling.

Konica is currently identifying markets for the rest of the uncoated waste paper as well as markets for bubble wrap and polypropylene film.

Manufacturing color photographic paper currently requires the use of high-purity organic solvents to dissolve chemical constituents. Konica uses significant volumes of ethyl acetate to achieve this process. Historically, spent ethyl acetate was disposed as hazardous waste. Konica has developed a system to reclaim the ethyl acetate from the coating solution and sell the lower grade solvent. The facility is evaluating alternative formulations that would eliminate the need for ethyl acetate. In addition to solvents, photographic paper manufacturing requires large volumes of water for tank temperature regulation and coating formulation. Water conservation was a major objective targeted in Konica's environmental management system. Several projects that have been put in place to achieve water conservation include reduction in tank wash time during cleanup by 10 minutes for all rinse cycles; recovery of deionizer rinse for use as cooling water; recovery of tank cooling water for production use; elimination of flume spraydown water used to suppress foaming (reduced surfactant use to reduce foaming); and recovery of pump seal cooling water for production use. Through the environmental management system, Konica continually evaluates its environmental performance and annually develops projects to reduce pollution and improve environmental performance.

Waste Reduced and Annual Savings. Konica recycles more than 40 tons per month of solid waste which represents more than 60 percent of the total solid waste generated. It is working to increase this recycle rate even higher in the coming months. The company has reduced the amount of hazardous waste shipped off site by more than 75 percent of 1996 levels. Water requirements have been reduced from 409,000 gallons per day to less than 275,000 gallons per day. Annual savings of these activities exceed \$165,000 per year.

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Did you know . . .
Recycled plastic is used to make items such as carpet, lumber, insulation, clothing, construction material, and fencing.

outstanding achievement medium business

Louisiana-Pacific Corporation

Background. Louisiana-Pacific's (L-P) Engineered Wood Products mill in Wilmington manufactures laminated veneer lumber and I-joints. The mill employs approximately 240 people and is a 24-hour per day operation. In December 1998, the facility formed an Environmental Committee to implement an environmental management system (EMS). This EMS is a plant-wide system to place environmental responsibility in the hands of plant employees and is intended to demonstrate the mill's commitment to its corporate environmental protection policy. The primary focus of the Committee is waste reduction and elimination of hazardous waste. L-P initiated another policy requiring the environmental manager to review all new projects and assess their environmental effects prior to implementation.

Waste Reduction Activities. In L-P's maintenance shop, metals are separated for recycling at a local scrap dealer, and an aqueous-based parts washer was installed to eliminate hazardous waste from cleaning chemicals. Electricians collect and recycle spent light bulbs containing mercury. The company also recycles all of its scrap copper wire. In addition, used fluids, batteries, and tires from the forklifts are separated and recycled. A water recirculator was installed in November 1999 at the forklift cleaning station, to greatly reduce the amount of water used. Aerosol spray paint cans have been replaced with refillable / rechargeable atomizers to minimize the amount of aerosol products used onsite. L-P has replaced the hazardous paint previously used for marking products with a nonhazardous marking fluid. All pallet dividers are separated and either sent back to Georgia-Pacific, where they are reused on trucks and railcars or reused onsite as storage dividers for raw materials. Aluminum cans are crushed and collected in the employee break room. In the office, paper is collected for recycling, and all empty ink jet and laser printer cartridges are collected and recycled. L-P also recycles all old telephone books. Finally, a major portion of the mill's waste stream is sawdust, ply trim, and other wood waste. In the past, the bulk of this material was taken to a facility for conversion to energy. In 1999, the mill installed a powerful magnet to remove all metal contaminants from the sawdust and ply trim, making that material more valuable for recycling markets. Also, L-P increased the value of its wood waste by source separating its sawdust into two sizes – fine and medium – and marketing the fine material to a brick plant and the medium-sized material to a composting operation and other markets.

The payback period for the equipment purchased in these efforts is: aqueous parts washer, one year; atomizers, immediate; aluminum can crushers, three months; paper recycling bins, three months; magnet, one month.

Waste Reduced and Annual Savings. L-P's past efforts resulted in a 55 percent reduction of solid waste from 1997 to 1998, and the continuation of those efforts coupled with the incorporation of many new procedures in 1999 has allowed the mill to remain at that level. Also, the replacement of hazardous materials with nonhazardous has taken great strides toward eliminating hazardous waste from the facility. In addition, innovative improvements in the marketing of sawdust and other wood wastes have made that system more efficient and cost effective, saving a net \$82,513 in 1999. That savings, coupled with the \$350 revenue from scrap metal sales, resulted in a total annual savings of \$82,863. Such continuous improvements are one of the major goals of the mill's Environmental Committee.

Location:
Wilmington
(New Hanover County)

Activity:
Manufacturer of laminated
veneer lumber and I-joints

Pollution Prevention Application:
Source reduction, reuse,
and recycling

Reduction:
Nearly 1,200 tons from 1997
baseline; no 1998 data available

Annual Savings:
\$82,863 (savings and income)

Contact:
Cara Muglia
Environmental Manager
910.762.9878

Did you know . . . In 1997, North Carolina imported 100,000 tons of municipal solid waste and exported 630,000 tons.

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outstanding achievement small business

EMJ America, Inc.

Location:

Apex
(Wake County)

Activity:

Computer distributor

Pollution Prevention Application:

Source reduction, reuse, and recycling

Reduction:

Not calculated

Annual Savings:

Not calculated

Contact:

Kathleen Conroy
Marketing Director
919.363.4441

Background. EMJ America began recycling its fine paper products in 1990 with two employees using discarded barrels from another company to collect the paper. When the paper market became inundated with material and hauling was no longer free of charge, EMJ invested in paper shredders and began to ship products in shredded paper instead of polystyrene peanuts. EMJ also collected used cardboard boxes from local businesses and sent all shipments in reused boxes. As EMJ grew, it persuaded its vendors to change their packaging strategies. One vendor, at EMJ's insistence, redesigned its plastic packaging to recyclable cardboard. A similar "buy green" ethic was pushed on many of EMJ's suppliers at the time.

Waste Reduction Activities. By 1998, EMJ had grown to more than 30 employees, and shipping personnel could no longer keep up with the paper generated by the company. At that time a recycling firm was hired to collect fine paper at the facility. Since June 1998, EMJ has recycled 1,395 pounds of white paper, 900 pounds of assorted paper and 1,670 pounds of glossy paper. In addition to these materials, EMJ recycles aluminum, glass, and plastic and has a company compost pile for lunchtime leftovers.

In 1995, EMJ purchased an abandoned schoolhouse on the shores of Jordan Lake to use as its corporate headquarters. The schoolhouse was unusable because a traditional method of handling wastewater could not be implemented on the property. As a result, an innovative wastewater design was created by a researcher at N.C. State University. EMJ received the first permit of its kind for wastewater recycling in North Carolina. The wastewater project is the first in the state to evaluate the direct recycling of wastewater for flushing toilets. It is also one of the few projects in the state to use a constructed wetland to cleanse polluted water. EMJ welcomes regular tours for others to learn from this innovative system.

A Web site [<http://waterrecycling.com>] was created, primarily with EMJ resources, to be used as a teaching tool for wastewater recycling. The Web site forms the basis for outreach efforts to schools in Chatham and Randolph counties and is used worldwide by numerous educators. Currently, interactive features are being added to the Web site that will allow children to monitor the water recycling via the Internet.

For the past seven years, EMJ has participated in the Adopt-A-Highway program, sending bags of recyclables to the county's convenience centers. Chatham County Public Works has reported visible spikes in recyclables intake whenever EMJ has its roadside cleanup.

Waste Reduced and Annual Savings: Assigning accurate weights for EMJ's waste diversion is difficult. Estimates are that many tons of paper and cardboard have been reused and recycled; many tons of plastic have been diverted from landfills; an abandoned, unusable building has been restored; and millions of gallons of water transformed from waste to reusable. It is also difficult to assign annual savings to EMJ's reuse and recycling efforts. The net cost of its environmental efforts would most likely exceed any recognizable gains on the balance sheet. One measurable aspect of EMJ's environmental commitment is the satisfaction gained by employees who are equally committed to responsible stewardship of the planet's resources.

8 Did you know . . . For every ton of paper recycled, 17 trees are saved.

outstanding achievement federal government

Naval Aviation Depot Cherry Point

Background. The Naval Aviation Depot (NADEP) Cherry Point provides maintenance, engineering, and logistics support on a variety of aircraft, engines, and components for all branches of the U.S. Armed Forces and various federal agencies, as well as foreign countries. NADEP employs 3,700 people and maintains a facility of 145 acres within the Marine Corps Air Station Cherry Point.

Waste Reduction Activities. NADEP waste reduction efforts focus on maximizing the usefulness of materials prior to disposal and on considering all reuse and recycling options before disposal in the landfill. The solid waste program has several processes and techniques to handle different materials generated throughout the depot including all metals, hazardous wastes, paper, cardboard, beverage cans, toner cartridges, and other miscellaneous items such as Christmas cards and compact discs.

The recently implemented Depot Maintenance Hazardous Material Management System (HMMS) business process allows for strict control and tracking for accountability, permitting, and reporting of hazardous materials. The Depot uses and track nearly 4,000 hazardous materials and last year handled 2.588 million pounds of hazardous materials. HMMS has already reduced the amount of material purchased significantly and will reduce the amount of material disposed as a hazardous waste. Of the material managed by the Depot, only 25 percent was sent for disposal at a landfill. Oils and fuels no longer usable in aircraft are burned in the station's steam generation plant or are sold to Auburn University for use in their boilers.

Waste Reduced and Annual Savings. Accounting for the amounts of material diverted from the landfill and sold through the recycling program, the Depot realizes both savings and revenue. The metals program has saved \$100,000 in disposal costs and realized \$281,150 in revenue. Paper and cardboard recycling have provided savings of \$63,330 and revenue of nearly \$20,000. Hazardous waste disposal costs have been reduced \$414,000 through recycling, and \$75,000 in revenue were generated through fuel sales for boiler operations. In a recent cost benefit analysis, the solid waste and recycling program was shown to pay for itself, while generating a \$300,000 surplus for the government.

Location:
Cherry Point
(Carteret County)

Activity:
Federal facility

Pollution Prevention Application:
Recycling and material diversion,
material control

Reduction:
650 tons of metal, 176 tons of
cardboard, 246 tons white paper, 75
percent reduction in hazardous waste

Annual Savings:
\$1,153,480 (includes revenues from
recycling)

Contact:
Joe Freeman
Energy and Environmental
Engineering Division Director
252.464.7647

Did you know . . . It takes 1,400 gallons of water to process a meal of a ¼ lb. hamburger, french fries and a soft drink?



outstanding achievement state agency

N.C. Zoological Park

Location:
Asheboro
(Randolph County)

Activity:
Educational, conservation, and
research organization

Pollution Prevention Application:
Energy and water conservation, solid
waste reduction and recycling

Reduction:
340,000 gallons water;
336,000 kwh; 89 tons solid waste;
1,100 tons organic debris

Annual Savings:
\$224,945

Contact:
Mary Joan Pugh
Business Officer
336.879.7110

Background. The N.C. Zoological Park offers educational, recreational, conservation, research, and recreational opportunities to 700,000 visitors, including 120,000 school children annually. The Zoo provides employment for 288 permanent staff.

Waste Reduction Activities. The Zoo's conservation efforts began in 1990 following an audit of the Zoo's operations. In 1994 the Zoo initiated the "Conservation Captains" employee awareness program to promote water and energy conservation, source reduction, and recycling. The Zoo also has employee awareness meetings, Earth Day, a Use Less Stuff Sale, and Adopt-A-Highway pickups.

Water. The Zoo uses 62 million gallons of water a year for exhibit tanks, irrigation, and cleaning animal areas. Water meters installed in 1996 detect leaks and measure usage for cleaning. Use of high-pressure, low-volume water nozzles and dry cleanup has reduced water use. Upgrades to the aquatic filtration systems in 1998 and 1999 resulted in less frequent turnover of backwash and fewer tank draining and filling cycles, adding to significant yearly savings. Nearly half of the potable water inflow is treated for reuse or released to onsite lakes. Non-potable water from these lakes is used to irrigate the Zoo's plant collections. **Energy.** In 1998, the Zoo began a computerized energy management system. Limiting power to the Education Center during evenings and weekends reduced electricity consumption 40 percent in one year. Charging energy usage to department cost centers has raised awareness and generated support for energy conservation among staff. Rangers and other staff use bicycles for ground transportation in lieu of combustion-engine vehicles, reducing gasoline consumption and air pollution. **Solid Waste and Recycling.** Zoo staff reduce office paper consumption at the source by using e-mail, expanding margins to increase text per page, and duplexing copies. Reuse of paper products conserves resources and saves purchasing costs. And, many warehouse supplies are purchased in bulk to reduce packaging waste. The Zoo collects office paper, corrugated cardboard, used motor oil, oil filters, tires, batteries, antifreeze, pallets, cooking grease, wood waste, plastic six pack rings, aluminum, and plastic bottles for recycling. The Zoo manages a Randolph County recycling center, where a variety of recyclable commodities are collected. **Composting.** In 1998 the Zoo opened its new compost site, surfaced with recycled coal fly ash. In 1999, the site received 1,568 tons of manure, bedding, plant material, food scraps, and corrugated cardboard. The Zoo uses its compost in landscaping and horticultural activities. A demonstration site in the Touch and Learn Center educates visitors on backyard composting. **Buy Recycled.** Zoo picnic tables and recycling containers are made from recycled plastic. Recycled plastic was also used for decking in the recent Aviary renovations.

Waste Reduced and Annual Savings. Water filtration and metering has saved 340,000 gallons and \$2,400 in one year. More than 336,000 kilowatts of electricity has been conserved, cutting the Zoo's annual energy bill by \$150,000, from \$700,000 to \$550,000. Bicycle use in the Ranger Unit alone has saved more than 2,000 vehicle miles per year and \$640. Source reduction of office paper has saved 376 reams, \$3,205 in purchases and copier costs, and \$7,000 in postage and labor annually. Recycling efforts in Fiscal Year 1998 diverted 88.4 tons of solid waste from disposal and have saved about \$4,500 in hauling and tip fees. A solid waste reduction grant from the N.C. Department of Environment and Natural Resources contributed to the Zoo composting 1,100 tons of organics in fiscal year 1999, saving \$80,000 in hauling, disposal, and the purchase of commercial soil supplements.

10 Did you know . . .
Paper makes up about 18%
of North Carolina's waste
stream.

achievement

significant

large business	Honeywell	page 12
medium business	Kennametal Inc.	page 13
state agency	N.C. State University	page 14



Did you know . . . **11**
Local governments recovered
the equivalent of 648,365
trees of wood fiber in their
paper recycling programs
during fiscal year 1997-98.

significant achievement large business

Honeywell (formerly Allied Signal)

Location:
Rocky Mount
(Edgecombe County)

Activity:
Hydromechanical controls for
aerospace manufacturing

Pollution Prevention Application:
Mineral spirits reuse and chlorinated
solvents elimination

Reduction:
Not calculated

Annual Savings:
\$230,500

Contact:
Eugene Richardson
Chemical and Safety Specialist
252.407.3756

Background. The Honeywell facility in Rocky Mount employs 560 people and manufactures fuel controls for the aerospace industry. To emphasize commitment to protecting the environment and public health, the facility chartered a Wastestream Minimization Team to address pollution prevention opportunities. A major objective of the team was to decrease the quantity and cost associated with the procurement, handling, storage, and disposal of solvents and chemicals used onsite.

Waste Reduction Activities. Virgin mineral spirits required in testing of the hydromechanical controls was identified as the largest waste stream by quantity. The Wastestream Minimization Team initiated a partnership with a vendor to start a reuse program for mineral spirits.

Chlorinated solvents used in the parts cleaning process were targeted for elimination. Substitutes were tested and approved which have led to the elimination of chlorinated solvent use. Hydrofluoric and picric acids have also been eliminated through increased testing of viable replacements.

The development of standard operating practices and training of employees has reduced fugitive emissions, lowered chemical evaporation problems, and improved inventory management.

Waste Reduced and Annual Savings. Financial benefits from the team's success have been achieved by waste disposal cost savings, procurement cost avoidance, and permit fee reduction. The mineral spirits reuse program saves more than \$30,000 annually. Using less hazardous materials in parts washers and ultrasonic cleaners saves an estimated \$200,000 per year in procurement costs. Filing of small quantity generator status saves \$500 per year.

significant achievement medium business

Kennametal Inc.

Background. Kennametal is a global manufacturer, marketer, and distributor of a broad range of tools for the metalworking, mining, and highway construction industries. It is a leading producer of cutting tools and wear resistant parts made of cemented carbides and other hard materials. Kennametal's Henderson Plant produces tungsten carbide metal powders that are used at other Kennametal sites to produce metal cutting tools. Waste reduction activities have focused on three processes: tungsten metal powder production, milling and drying, and packaging.

Waste Reduction Activities. The tungsten production process previously used ammonium paratungstate. Testing was conducted on tungsten oxide to compare the quality of the tungsten metal produced from the oxide. The results showed comparable quality, and the tungsten oxide was gradually introduced, eliminating ammonia emissions.

Solvent replacement was done for an n-hexane-based solvent used in the milling and drying process. The new solvent has less than one percent n-hexane, which significantly reduces emissions, although the new solvent costs 15 percent more than the previously used solvent.

Automated packaging equipment was purchased to package the finished powders into three kilogram aluminum containers. These containers are ergonomically friendly for both packaging personnel and customer plants where the powder is used. There has been a significant reduction in labor, worker exposure has been greatly reduced, and scooping powders from larger bins has been eliminated, reducing spillage at customer plants. The aluminum containers are returned to the Henderson Plant, where they are shredded and sent to a sister plant to be recycled in a thermic process. This has eliminated waste polyethylene containers and waste plastic bags, while reducing space requirements for the packaging process.

Waste Reduced and Annual Savings. By converting to a tungsten oxide, ammonia emissions have been reduced from 50,000 pounds to 27,000 pounds the first year, and since January 1999, ammonia emissions have been totally eliminated. Although the cost of the tungsten oxide is slightly higher than the previously used ammonium paratungstate, the cost is offset by savings associated with reduced utilities, nitrogen process gas, labor, and increased productivity. This has resulted in a projected annual savings of \$35,000. The solvent substitute used in the milling and drying process costs approximately 15 percent more than the previously used solvent, but because the previous solvent usage was approaching the upper limit for n-hexane emission under air toxics regulations, the reduction by 50-70 percent in n-hexane emissions is worth the extra cost. The packaging system previously used cost an average of \$0.227 per kilogram of powder. The new packaging system costs an average of \$0.104 per kilogram of powder. The annual savings are estimated at \$86,500 per year. The payback period for the new equipment was less than two years.

Location:
Henderson
(Warren County)

Activity:
Manufacturer of tungsten carbide
powders

Pollution Prevention Application:
Product substitution, equipment/
process changes

Reduction:
50,000 lbs. ammonia emissions, 50
percent to 70 percent reduction n-
hexane emissions, 5 tons-10 tons/
year waste containers

Annual Savings:
\$121,500

Contact:
Robert McGee
Environmental Health and Safety
Administrator
252.430.3303

Did you know . . . **13**
North Carolina boasts nearly
500 recycling companies.
These growing companies con-
tribute to local economies and
the tax base of the state.

significant achievement state agency

N.C. State University

Location:
Raleigh
(Wake County)

Activity:
State university

Pollution Prevention Application:
Solid waste reduction and recycling

Reduction:
17,480 cubic yards leaf and
landscaping debris; 1,126 tons
recyclables

Annual Savings:
\$645,054 in disposal fees and mulch
purchases

Contact:
Bill Beardall
Assistant Director of Facilities
Operations
919.515.9872

Background. N.C. State University (NCSU) is a research and teaching institution serving more than 25,000 students and employing more than 10,000 faculty and staff. The University generates solid waste in classrooms, dormitories, laboratories, offices, dining halls, and at other campus facilities.

Waste Reduction Activities. Since 1990, yard debris and leaves collected during campus landscaping activities has been brought to a site on the Centennial Campus to be mulched. The site, run by two full-time employees, produces 12,000 cubic yards of ground and screened wood mulch and 27,567 square feet of composted leaf mulch annually. Mulch produced at the site is used on campus flowerbeds and in new landscape installations.

In addition to recycling campus organics, the site also accepts yard debris from local landscapers and the City of Raleigh. During the 1999 Special Olympics World Games the University collaborated with the N.C. Division of Pollution Prevention and Environmental Assistance to collect and compost about seven tons of food waste from the athlete dining halls at NCSU and nearby Meredith College. The University was granted a temporary Type III compost facility permit to conduct this project.

NCSU recently upgraded and expanded its recycling program to include an estimated 400 collection areas at 140 separate campus buildings and locations. Materials collected for recycling include paper, corrugated cardboard, scrap metal, plastic bottles, aluminum and steel cans, white goods, motor oil, antifreeze, tires, asphalt, and fluorescent lamps. Recyclables are collected from campus locations in 44-gallon roll carts on a weekly or biweekly basis and sorted into larger containers at a central facility operated by University staff. Employees sort paper and segregate other materials into larger containers before transporting them to recycling markets. Improvements to the pick-up schedule, employee outreach, signage, and the centralized collection area have helped to enhance the University's recycling efforts.

Waste Reduced and Annual Savings. NCSU's recycling program has reduced landfill disposal and costs as well as generated revenue from the sale of recyclable material and mulch. During Fiscal Year 1998-99, the University saved approximately \$106,910 in tipping fees for yard debris and \$470,668 for recyclables. Using leaf and wood mulch saved \$168,000 in purchase costs for commercial soil amendments. Sales of mulch and recyclables netted approximately \$30,000 and \$23,278 in revenues respectively.

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Did you know . . .
Mobile sources, such as
vehicles, contribute to
more than half the total of
NOx emissions.

steward exceptional

large business	Beers Construction	page 16
state agency	N.C. Department of Administration, Motor Fleet	page 17
state agency	Sampson Correctional Institute	page 18
local government	Union County Public Works	page 19



exceptional steward large business

Beers Construction

Location:
Raleigh, Winston-Salem, and
Charlotte
(Wake, Forsyth, and Guilford
counties)

Activity:
Construction

Pollution Prevention Application:
All media waste reduction

Reduction:
Not calculated

Annual Savings:
Not calculated

Contact:
Michael Hardman
Engineer
336.759.7800, ext. 146

Background. Beers Construction, owned by Swedish company Skanska, has three North Carolina offices that report to corporate offices in Atlanta, Ga. Skanska has required all its operations to be ISO 14001 certified by the end of 2001. Beers Construction received certification of its environmental management system (EMS) to ISO 14001 in late 1999.

Waste Reduction Activities. At the start of each new construction project, managers and supervisors review a list of 11 aspect areas. Several aspects for each new job site are selected, and tracking methods are put into place.

As part of Beers' EMS, all employees receive training on the importance of protecting the environment. Company mascot "Milo" was created to promote message awareness. Employees and subcontractors wear Milo stickers on their hard hats. Beers has a general video for employees on environmental awareness and an EMS that includes environmental opportunities at job sites.

Sustainable design is one of Beers' 11 aspects. In the future, Beers will seek to talk with client's architects to select more environmentally conscious products in pre-design. Their work with architects includes a database developed by Beers to track cost histories over the life of a product to better show owners cost-savings over time.

Another aspect is air emissions. Beers seeks to control dust from trucks by spraying trucks before they leave the job site to limit dust and dirt on roads exterior to the site. Beers also uses low volatile organic compound paints where possible. Also, Beers participates in the Triangle Air Awareness Coalition.

Waste Reduced and Annual Savings. Aspects with quantified savings for North Carolina operations for 1999 include transportation, water conservation, waste management, and energy conservation. In transportation, Beers calculated that 26 employees and 44 subcontractors saved more than 300 miles. For all sites, employees may now use electronic timesheets rather than driving to the main office to complete these. Also, at job sites where parking is limited, Beers offers "park and ride" options. Beers also facilitates employee carpooling to work. In water conservation, Beers saved 100 gallons from reduced flow preventers. Water consumption is high in their masonry division, so daily inspections ensure water is turned off. At the new construction project at Guilford College, Alamance County, Beers recycles materials onsite, then puts them into proper recycling bins on the school's campus. In 1999, Beers reduced landfill costs by \$3,500, received \$800 in revenue from cardboard sales, received \$5,100 from metals recycled in-house as well as diverted a substantial amount of metals for recycling through its subcontractors, and received \$1,100 from recycled office products. Other materials such as pallets, five-gallon paint buckets, plastic sheeting, scrap insulation, and scrap duct work are reused. Energy conservation efforts include the installation of motion-detectors in bathrooms and installation of a timing system on the heating and cooling system at their Winston-Salem offices as well as installing timers on job-sites to control power use as well as to extend the life of job-site temporary light fixtures.

Beers saved \$231,798 in 1999. Its cost to implement EMS in all Southeast offices was \$750,000. A 1.5-year payback period is expected if savings continue at current rate.

16 Did you know . . .
Packaging materials make
up 30% weight and 50% volume
of North Carolina's
waste stream.

N.C. Department of Administration, Motor Fleet

Background. Among its responsibilities, N.C. Motor Fleet Management (MFM) Division in the Department of Administration purchases vehicles for use in state business under state contract specifications. By statute, vehicles are not normally replaced until they have been driven 90,000 miles. Each year MFM replaces nearly 1,400 vehicles with new vehicles.

The rebuild program is comprehensive and includes a new engine, transmission, brakes, suspension, new seats, carpets, dash pads, and other items appropriate to the specific vehicle and its intended service. The program began with a pilot project of 60 1993 to 1996 Chevrolet Caprices. Upon successful completion of the pilot, a contract was established to rebuild an additional 220 vehicles. With that goal complete, MFM set a new goal: to rebuild as many of the 850 Chevrolet Caprices in the fleet as possible.

Waste Reduction Activities. In addition to the rebuild program, MFM is involved in many environmentally sustainable projects. Principal among these are the continued goals of "rightsizing" the state's fleet, i.e., providing the most efficient vehicle for the intended job, commitments to major testing of alternative fuel vehicles, and expansion of the alternate refueling infrastructure. Other waste reduction projects include oil bypass filters, tire recycling, conversion of confiscated vehicles for undercover work, used oil filter crushing, participation in WasteWise program, and expanding the rebuild program to include courier vans and large four-wheel drive vehicles.

In the alternative fuels project, MFM has available approximately 800 dual-fueled vehicles, primarily passenger sedans and mini-vans for routine business use by state employees. These vehicles are capable of running on gasoline or E-85 (ethanol) fuel, which is purchased under contract and is manufactured from beer distillery waste, a North Carolina product. The current contract price for E-85 fuel is 80 cents per gallon. MFM has used, as of January 2000, nearly 49,000 gallons of E-85 fuel instead of gasoline. Reduced air emissions and reduced dependency on foreign fossil fuels are also advantages. In addition to the dual-fuel vehicles, MFM continues to explore other alternate fuel sources. Another 15 vehicles are available that operate on electricity, propane, or compressed natural gas (CNG).

Waste Reduced and Annual Savings. While the number of cars being rebuilt continues to increase, to date, the data from the first 220 vehicles involved an average rebuilding cost of \$10,278. Under this contract, the average savings per vehicle has been \$10,631. The savings that have resulted from not having to purchase new vehicles has been \$4,338,820. The total costs saved have been \$2,813,680 for the 280 vehicles rebuilt through the pilot and first main contract. As the rebuild program continues, if all of the targeted 850 Chevrolet Caprices can be rebuilt, the savings over new vehicle purchases to the state budget will exceed \$8 million.

Location:
Raleigh
(Wake County)

Activity:
State vehicle rebuild program

Pollution Prevention Application:
Reduce N.C. governments' need to purchase new vehicles, reuse previously purchased vehicles through a second "lifespan"

Reduction:
To date, reduced state's new car purchases by 280 vehicles

Savings:
\$2,813,680, or \$10,631 per vehicle

Contact:
John Massey and Danny Willis
Director and Assistant Director,
respectively
919.733.6540

exceptional steward state government

Sampson Correctional Institution

Location:
Clinton
Sampson County

Activity:
Organic waste reduction and recycling

Pollution Prevention Application:
Solid waste recycling and food waste
vermicomposting

Reduction:
86 percent reduction in solid and
organic waste

Annual Savings:
\$83,000

Contact:
Stephen Muller
Assistant Director of Solid Waste
910.592.2151

Background. Sampson Correctional Institution (SCI) is dedicated to protecting the environment and saving valuable tax dollars. Sampson houses the state's largest laundry facility and has an inmate population of 468. Because of the nature of SCI, large quantities of food, paper, and cotton fiber waste are generated. To reduce the amounts of these sent to the landfill, Sampson implemented a vermicomposting program that produces a high grade compost product from the food waste, shredded paper, and lint.

With the vermicomposting program in full operation, SCI estimates that organic waste biosolids will be reduced by approximately 45 tons annually. Vermicomposting is a low-tech and low-cost way to process organic waste products into a suitable soil amendment. The units accommodate 200,000 worms that eat approximately 125 pounds food waste per day. It provides an inexpensive quality product that protects North Carolina's environment by conserving natural resources, eliminating waste, and limiting negative effects on the environment.

Increased recycling of steel and aluminum cans, plastic, and cardboard has also resulted in substantial reductions in disposal fees. Sampson is also virtually plastic foam free. Facility staff and inmates use plastic/glass beverage containers that were purchased from revenues generated for the sale of aluminum cans. Both the solid waste and organic by-product recycling projects have resulted in tremendous savings in waste management costs as well as natural resource conservation. SCI is committed to environmental sustainability in state government.

Waste Reduction Activities. To determine the amount of prepared food waste, the kitchen conducted an audit. Based on findings, menus and amounts served were adjusted. Due to the reduction in excessive food purchases and waste generation, quarterly food costs for the SCI inmates decreased from \$488 to \$168. The remaining 480 pounds to 700 pounds of food waste generated daily are handled by two vermicomposting units. The dramatic reduction in organic wastes resulted in the changeover from five eight-cubic yard dumpsters pulled weekly to one 34-cubic foot compactor emptied once a month. A baler is now used to recycle aluminum cans, cardboard, steel cans, and plastics. All materials baled are now sold.

Waste Reduced and Annual Savings. Before the implementation of the facility-wide recycling program, SCI was sending approximately 120 tons of waste to the landfill at a cost of \$6,800 per month. With the tremendous reduction in food waste and collection of recyclables, one compactor is pulled monthly for annual savings of \$74,000. Additionally, 3.2 tons of cardboard, one ton of steel cans, ¼ ton of plastic, and 1,200 tons of aluminum cans are baled and sold for a profit of \$2,200 monthly. SCI has collected waste generation and management data and determined that 86 percent of the waste originally sent to the landfill is now either composted or sold as a recyclable. At SCI, the recycling program is a team effort that involves participation from management and administration, as well as inmates. Through these innovative efforts, SCI realized it could find ways to reduce waste and find a return in what the facility was using through its recycling and reuse efforts.

18 Did you know . . .
Six gallons of water are
needed to produce one gallon
of gasoline.

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Union County Public Works

Background. Encompassing 640 square miles, Union county is located in south central North Carolina, east of Mecklenburg County. The County's close proximity to Charlotte has made it one of the fastest growing counties in North Carolina and has a population of 110,000 (July 1, 1998). Union County's Public Works Department provides potable water services, wastewater treatment, household hazardous waste disposal, and solid waste and recycling services for the County.

Waste Reduction Activities. Union County focuses waste reduction efforts in two major areas: wastewater reclamation and industrial pretreatment. To minimize discharges to the local watershed, the County placed two wastewater treatment plants (WWTP) online in 1997. The first facility, Olde Sycamore WWTP, was placed online in the spring of 1997. The Olde Sycamore Facility is a package plant that provides extended aeration, secondary clarification, tertiary filtration and ultraviolet disinfection to a golf course community of approximately 500 homes. After disinfection, all effluent is transferred to a lined holding pond for ultimate use as irrigating water for the golf course. Although the County operates the WWTP, all costs associated with its development were paid by the golf course developer.

The second facility, 12 Mile Creek WWTP, was placed in operation in December 1997 and handles a larger flow of wastewater than the Olde Sycamore Facility. Similar to the Olde Sycamore Facility, the 12 Mile Creek Facility is a high-tech treatment plant that provides extended aeration, secondary clarification, tertiary filtration and ultraviolet disinfection to a golf course community of approximately 500 homes. After disinfection of effluent. Upon disinfection, the effluent is ready for beneficial reuse. The 12 Mile Creek Facility cost \$20 million and was financed with revenue bonds, eliminating the need to increase local taxes.

Although Union County does not have many industrial clients, the County developed an industrial pretreatment program to help minimize releases to the local wastewater treatment system. One local industry was discharging 10,000 gallons per day to the Crooked Creek Water Reclamation Facility. This industry's effluent typically had a pH below 5.0 and a biological oxygen demand greater than 1,000 milligrams per liter. The Public Works staff provided testing, analysis, and recommendations to this local industry, resulting in a change in the industry's practices. The company now diverts the effluent to holding tanks that are batch treated with flocculent, which allows the water to be reused inhouse.

Location:
Monroe
Union County

Activity:
County's provider of potable water services, wastewater treatment, household hazardous waste disposal, and solid waste and recycling services

Pollution Prevention Application:
Wastewater reclamation and industrial pretreatment

Reduction:
Not calculated

Annual Savings:
Not calculated

Contact:
Mark Tye
Assistant Director of Solid Waste
704.296.4217

Did you know . . . **19**
You can save up to 5 gallons of water everyday by turning off the faucet while brushing your teeth?

North Carolina Department of Environment and Natural Resources



The N.C. Department of Environment and Natural Resources (DENR) is the lead stewardship agency for the preservation and protection of North Carolina's outstanding natural resources. The organization, which has offices from the mountains to the coast, administers regulatory programs designed to protect air quality, water quality, and the public's health. DENR also offers technical assistance to businesses, farmers, local governments, and the public and encourages responsible behavior with respect to the environment through education programs provided at DENR facilities and through the state's school system. Through its natural resource divisions, DENR works to protect fish, wildlife and wilderness areas and provides exceptional opportunities in recreation and education. The agency's activities range from helping ensure drinking water is safe to managing state parks and forests for safe and enjoyable outdoor recreation experiences. From A (aquariums on the coast) to Z (the N.C. Zoological Park), DENR touches the lives of all North Carolinians and our guests in many ways to enhance and ensure our quality of life.

North Carolina Division of Pollution Prevention and Environmental Assistance



DENR's Division of Pollution Prevention and Environmental Assistance (DPPEA) focuses its efforts on environmental sustainability by providing free technical and other non-regulatory assistance to reduce the amount of waste released into the air and water and on land. DPPEA emphasizes waste reduction through pollution prevention and encourages companies and government agencies to go beyond compliance.

Services DPPEA provides include technical assistance, outreach and training, marketing assistance for recyclable materials, information clearinghouse, and financial assistance. DPPEA offers its services to industrial facilities, commercial and institutional operations, state agencies and local government, small businesses, trade associations, professional organizations, and nonprofit organizations.

DPPEA provides pollution prevention assessments that address air emissions, water pollutants, and solid and hazardous wastes that help facilities reduce their waste generation, achieve regulatory compliance and save money. Learn more about DPPEA by visiting <http://www.p2pays.org> or calling 800.763.0136.

STATE OF NORTH CAROLINA

James B. Hunt Jr., Governor

N. C. DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

Bill Holman, Secretary

DIVISION OF POLLUTION PREVENTION AND ENVIRONMENTAL ASSISTANCE

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