



# Other State Agencies and Programs

## Florida Department of Management Services

Section 287.045, Florida Statutes, as amended, establishes Florida's procurement plan for recycled content products under the authority of State Purchasing, Department of Management Services. The 1993 amendments continue to require a number of actions designed to reduce barriers to recycling and give State agencies more responsibility for purchasing recycled content products. An elective 10% price preference for recycled content products is included with an additional 5% price preference for products produced from Florida recovered materials. State agencies are permitted to give consideration to recycled product life cycle costs when evaluating bids. Further, laws passed by the 1993 Florida Legislature require a minimum 10% post consumer recovered materials in recycled printing and fine writing grades of paper.

The State Purchasing procurement system is decentralized, and State agencies are not required to use State contracts for their purchases. State contracts account for approximately 30 percent of the dollar volume spent by agencies for commodities, but the 1993 procurement legislation amendments focused more on the remaining 70 percent of State commodity purchases. All State agencies are required to purchase recycled content products, which helps to enhance the markets for recyclable materials.

As a means of tracking procurement activity, a uniform reporting mechanism was established

for State agencies to report purchases of recycled content products. Agencies and universities report their usage of printing and fine writing grades of paper each quarter. This purchase history is shown graphically for the State in Figure 31.

The current State Purchasing budget allocation encourages purchasing which will contribute to participation in Sustainable Development concepts. These include energy conservation, source reduction, materials recycling, life cycle costing, and an overall reduction in negative environmental impact.

### *Recycled Content Items on State Contract*

The number of recycled content items available on State contracts exceeds 1,500. The items are available to review in an online listing in an Index of Recycled Content Products and Services on State Term Contracts. This service is provided to enhance product visibility to contract users.

State Purchasing establishes and manages programs that enhance sustainable development and recycled product markets. Major project areas include:

- Resource Recovery Program
- State Negotiated Agreement Price Schedules (SNAPS)
- Florida Recycled Content Product Listing
- Capacity Management and Natural Gas Acquisition
- National Association of State Purchasing Officials (NASPO) Database of Recycled Products (DRC)
- Uniform Reporting System.

DMS intends to pursue additional studies designed to gather technical information to be used to further promote the purchase and use of recycled content products and materials.

**1999-2000 Projects**

The Bureau of Commodities (formerly Bureau of Standards and Programs Management) modified and enhanced several significant contracts during the 1999 and 2000 period. A new contract was established for playground equipment that contains products with recycled content, the carpet contract was revised to provide for the recovery of materials for use in manufacturing recycled content products; and, two copier machines and related equipment contracts were changed to request that bidders describe their internal recycling programs. Efforts were made to promote the use of recycled content tile products through new and remodeling construction projects. In addition, a new contract was established for end-of-life electronic equipment.

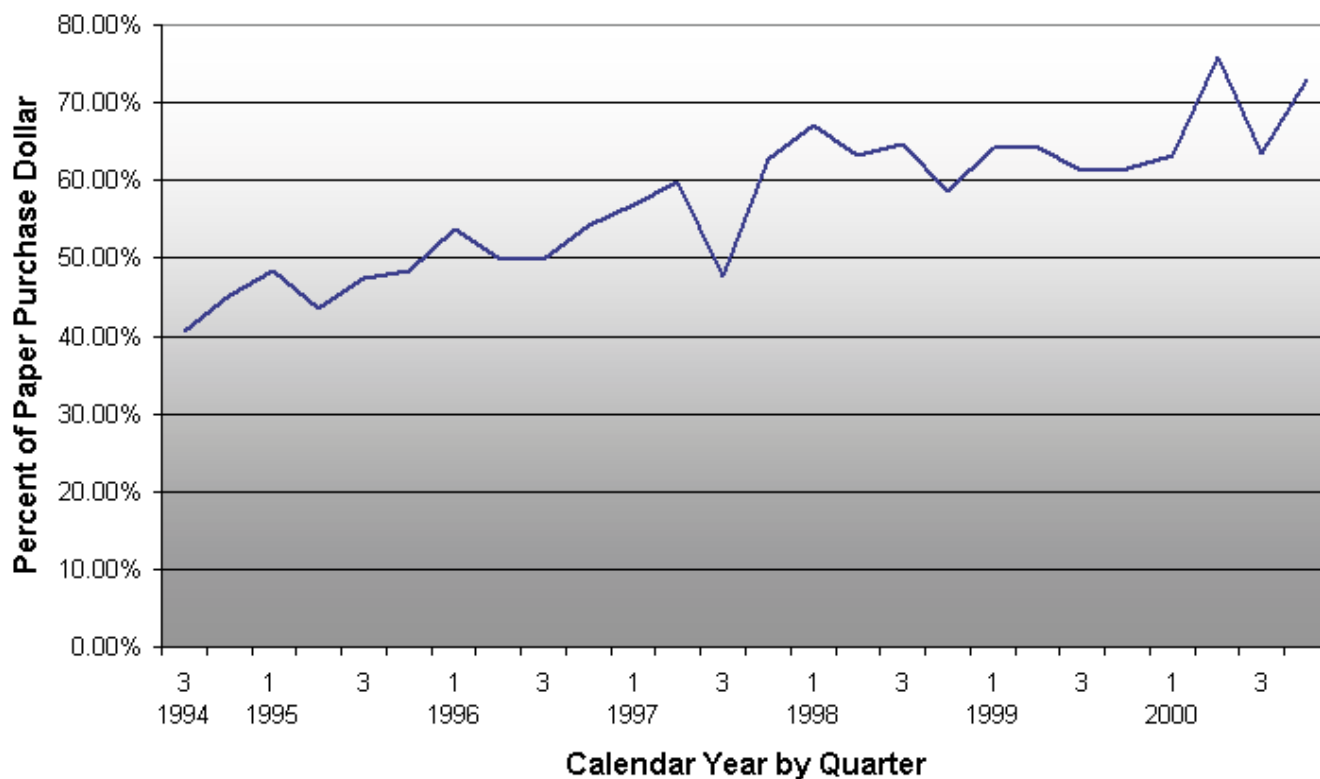
The Park and Playground Equipment contract, with over \$ 1.3 Million in reported sales, was established. The Park and Playground Equipment contract bid was developed to allow State Purchasing offices and other governmental entities, especially local counties and school boards, to buy from a volume discounted contract. Research and analysis by

the Bureau of Commodities into this industry determined that sufficient quantity of items from manufacturers using post consumer material in production, could be purchased from a resulting contract. Categories were added to the bid to allow competition in playground equipment and surfacing materials containing recovered materials.

In 2000 the State term Carpet and Flooring contract was revised to allow and encourage all contract users to use contract service providers that recover used carpet and avoid placing these materials in landfills. Additionally we have encouraged the manufacturers of carpets to reclaim fibers from old carpet and use the material in production of new products. One manufacturer has provided documentation of 197,729 pounds of used carpet recovered from Florida government buildings.

There have been a number of opportunities to enhance green initiative procurement through technology product contracts. Specific language was added to the Walk-up Convenience Copiers and Copy Equipment, Multifunction, and Specialty Application Devices contracts. It requires all

**Figure 31: Recycled Printing and Writing Paper Purchases at State Agencies and Universities**



bidders participating in recycling, or materials and equipment recovery programs, to include complete descriptions of their company's recycling plans in their contract service proposal. Many manufacturers' web sites describe their environmental programs, and can be viewed through links from the My Florida web page at:



<http://www.myflorida.com/myflorida/business/index.html>

Concerns regarding the disposal of computers, cathode ray tubes (CRTs), printers, telephones, fax machines, and other items including VCRs, radios, and televisions, have prompted Florida State Purchasing to establish a contract for the recovery, recycling and disposal (as a last resort) of these items because the State owns a great many of them, and they contain some potentially hazardous materials.

Today, technology and commercial infrastructure exists to recover and de-manufacture much of the equipment and materials used in the manufacturing of these items. In a cooperative effort with the Department of Environmental Protection, State Purchasing has contracted with Superior Special Services, Inc. They will provide managers and property administrators with competitively priced recycling services for all electronics. The handling and disposal alternatives provided in this contract give those accountable a cost effective and environmentally responsible management tool to use when these items reach the end of their useful life. The State Term Contract for these services, effective June 19, 2000, is entitled Recycling Services, End of Life Electronics.

More information about electronic equipment recycling can be found in Chapter 6, Special Waste, and also at the Department of Environmental Protection's website at:



<http://www.dep.state.fl.us/waste/categories/electronics/>



Bales of Carpet that have been collected and sorted for recycling.  
Photo: Bill Hinkley

### *Office Paper Collection and Recycling*

1999 marks the 11th year for the Department of Management Services Resource Recovery Program. Since the program inception, public interest in recycling has grown enormously, and this interest has migrated to the workplace. State employees, through a spirit of good stewardship, and their desire to more effectively manage their environment, are the primary reason for the success of the program. Figure 32 graphically represents the progress of the Department of Management Services' Resource Recovery Program since July 1990.

Annual increases in paper recycling tonnage were experienced until the markets began to decline in 1993/94. With the expiration of the statewide contract in October 1999, the collection program was continued with a State Negotiated Agreement Price Schedule (SNAPS). A new contract was negotiated in March 2000, however, there was a decrease in tonnage for the program, because the contract only covered the Leon County service area.

When the program began, only office paper was collected. Under a contract awarded in October of 1995, the program collected such materials as corrugated cardboard, newspaper, telephone books, magazines, catalogues, as well as all types of envelopes and office paper. The contract was awarded as a mixed paper program for the Department of Management Services' pool facilities





Recycled content paper often comes in green boxes.

Photo Lisa Bujak

located throughout the State, and available to other eligible users by mutual consent of the contractor and prospective user agencies. Other eligible users are defined as political subdivisions, county, local county board of public instructions, municipal, or other local public agencies or authorities and state universities.

In 1999, the Department of Management Services issued a Request for Proposal for a new statewide recycling contract. Due to lower market prices and budget constraints, there was no contract awarded. The two proposals received for recycling services for the State of Florida had a substantial service cost included in the proposals that prohibited an award. In March 2000, the Department of Management Services entered into negotiations with a responsive bidder to provide recycling services in the Tallahassee Area. The agreement between the Department of Management Services and the vendor was effective until October 2001.

We have determined that the benefits of recycling include the avoided costs that would otherwise be incurred if the materials were not recovered, and were taken instead to a landfill. The justification for recycling is clear. Tipping and container pull fees have continued to increase while landfill space continues to decrease. Each time the recycling containers at various locations around the state are filled, tipping fees are saved and charges avoided by not having the material placed in a landfill.

### *Florida State Recycled Content Product Listing*

A Recycled Content Products List is maintained by the Materials Research Section showing products available through State term contracts, SNAPS agreements (State Negotiated Agreement Price Schedule), PRIDE (Prison Rehabilitative Industries and Diversified Enterprises) and RESPECT of Florida (registered service mark of the Florida Association of Rehabilitation Facilities, Inc.) The list includes a number of paper products, remanufactured laser printer cartridges, glass spheres, thermoplastic pavement markings, automotive and marine batteries (lead acid), and garbage cans.

### *SNAPS*

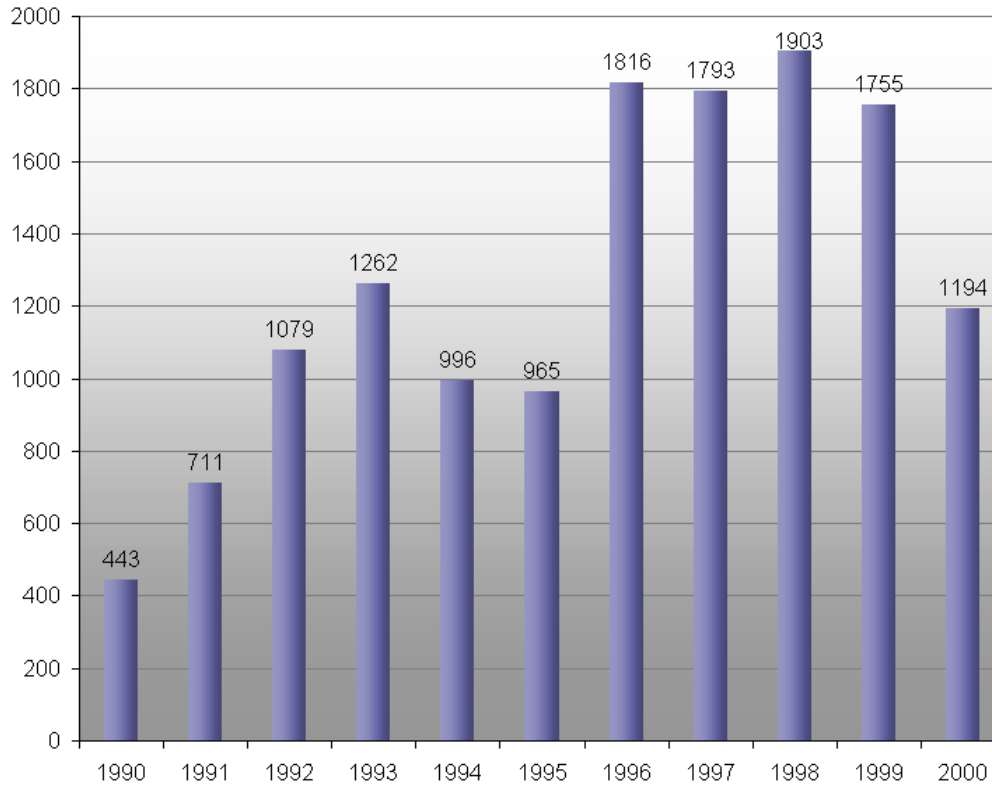
SNAPS (State Negotiated Agreement Price Schedule) originated as a program that streamlined the procurement of environmentally preferable commodities and services through non-mandatory, non-exclusive, agreements used by State agencies or other governmental entities. Today SNAPS II does this and more.

### *State Negotiated Agreement Price Schedule: SNAPS II*

The SNAPS II (State Negotiated Agreement Price Schedule) program establishes optional use, non-exclusive agreements for commodities and services not available from a State Term Contract. These agreements provide pre-negotiated quotes, which simplifies the procurement process for State agencies and other governmental entities.

SNAPS II agreements established by the State Purchasing Office streamline the procurement process for vendors who wish to market products and services that are not available from a State Term Contract. As such, the SNAPS II Program provides an avenue for environmental-type commodities and services to be made more readily available to potential customers.

SNAPS II agreements established include products such as remanufactured computers, inkjet and ribbon

**Figure 32: Recovered Office Paper (in Tons, by Fiscal Year)**

cooperative code and delivery points. The DRC is available on the Web through the Florida Communities Network (FCN) for use nationwide by every state with designated participants.

### *Work Plan*

The movement by Florida State Purchasing to integrate buying recycled content products into the broader concept of a sustainable environment business process continued to become more of a reality. It is now recognized that a

cartridges; products made from ground tire rubber, plastic wood, recycled plastic, reclaimed rubber (i.e. flooring); and services such as environmental consulting services, air cleaning equipment and services, water treating services, etc.

### *NASPO Database of Recycled Commodities*

In 1996, Florida State Purchasing expanded its efforts to promote the use of recycled products on a national scale. In cooperation with the National Association of State Purchasing Officials (NASPO) and the United States Environmental Protection Agency, Florida State Purchasing redesigned and implemented the NASPO Database of Recycled Commodities.

This database contains information from 12 state governments relative to the descriptions, availability, and pricing of recycled content products and may be searched in single or multiple parameter formats. DRC subscribers may search and view recycled product data by brand name, manufacturer name, distributor name, common name, contracting state,

goal which envisions the reduction in the use of raw materials, coupled with the use of recovered materials, offers a superior approach to achieving a “Sustainable Florida” rather than a single (recycling) concept. The goal has moved beyond reduced dependence on landfills. More recent efforts of State Purchasing, specifically the Bureau of Commodities, take on an even greater significance as we continue in our role as a resource for the advancement of markets for recovered materials, reduced resource products, continued conversion to clean burning natural gas, resource recovery, energy efficiency, and new technology products and services. DMS continues their commitment to provide cost effective services that stress the economic, environmental and social advantages of a diverse procurement and material management system.

DMS continues to evaluate and specify recycled content products and to maintain and increase the number of products made readily available through State contracts and SNAPS agreements to State agencies, universities and political subdivisions. The refinement and enhancement of the Uniform

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Reporting System will be an ongoing task for the design team and the Materials Research Section personnel who assimilate and compile procurement data. Goals include the dissemination of “Sustainable Florida” information for use by all government entities interested in implementing cost effective, and environmentally responsible procurement policy. DMS proposes to assist agencies in the application of such information and to lead by example.

As part of the procurement process, products are researched and evaluated for recycled content and other environmental impact characteristics. Methodologies are evolving to value environmental costs and resource recycling that will help us make buying decisions that will balance environmental and economic considerations. After specification development, new items may be competitively bid for addition to State term contracts, or be considered for inclusion in SNAPS agreements. State contracts are available to all government entities and political subdivisions in Florida.

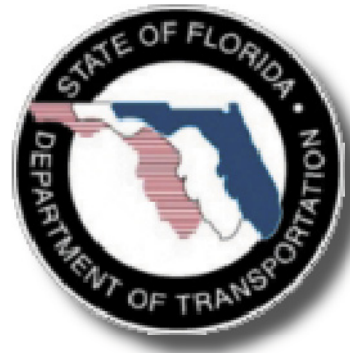
A study conducted by Florida A&M University indicated that the major barriers to the purchase of recycled content products are, in order of importance, price, quality, and availability. The next logical step is to determine how to overcome these barriers. To achieve this, we intend to contract for the design of a Market Plan, which will provide ways to enable us to increase the volume of recycled content products purchased by government agencies in Florida.

Other projects may have environmental and economic benefits to the State through sustainable development. Examples include the procurement of specific commodities to ensure energy savings or service, acquisitions to manage the “control” of hazardous materials, or the development of markets for recycled content products. DMS also anticipates providing more lease options in state term contracts as an acquisition method to promote reuse of products and materials by environmentally conscious manufacturers.

State Purchasing has produced one of the most contemporary and aggressive “Sustainable

Development” procurement programs in the Nation. This operation requires the staff to participate and contribute to various organizations. These include:

1. Recycle Florida Today
2. The National Recycling Coalition
3. The American Society for Testing and Materials
4. The National Association of State Purchasing Officials
5. The National Institute of Governmental Purchasing
6. The Florida Association of Public Purchasing Officers
7. American Gas Cooling Center
8. Gas Research Institute



### Florida Department of Transportation

The Department of Transportation is continuing to play a critical role in meeting environmental challenges associated with the use of waste products and reducing the amount of refuse placed in our State’s landfills. These challenges have made recycling a priority of the Department.

The Department is a recognized leader in the recycling of asphalt pavement which is a two part process consisting of the removal of substandard, deficient old asphalt pavement and the reuse of the reclaimed asphalt pavement (RAP) as a component in a new asphalt mix meeting today’s standards. This recycling process results in improved pavement performance by reducing reflective cracking and also

represents a savings in energy and raw materials.

Florida began recycling asphalt pavement in 1979 and the use of recycled asphalt became the standard method of pavement rehabilitation in 1983. Annually the Department uses about 3 million tons of asphalt mix containing RAP, with an annual materials savings of over 11 million gallons of asphalt cement and over 800,000 tons of aggregate. This program results in an annual savings of our transportation construction dollar by \$15 million per year.

In 1994, the Department implemented specifications for the use of ground tire rubber as an additive to asphalt friction courses for improved durability and pavement life. Recycled tire rubber is also used in appropriate locations beneath the road as an Asphalt Rubber Membrane Interlayer, which helps to prevent the spread of cracking and serves as a moisture barrier.

The Department estimates that we use around 7500 tons of recycled tire rubber for asphalt pavement annually. This represents approximately 1.5 million waste tires annually.

The Department continues its efforts to utilize compost materials in our road construction and maintenance projects. A Finish Soil Layer specification was included in the 2000 Standard Specifications for Road and Bridge Construction providing contractors an opportunity to achieve a 10% organic content in the soil after mixing, through the use of composted materials. The Department has also funded two research projects that help us understand how to use this valuable recycled material to stabilize slopes and to improve the quality of our roadside turf.

The Department's use of recycled products is also targeting the use of recycled plastic fence posts, delineator posts, rebar support, and guardrail blockouts. We have also found application for waste products such as fly ash, slag and silica fume in the production of concrete. Recycled aggregates from Portland Cement concrete pavements are also being used in asphalt and concrete pavements.

The Department participates in the Department of Management Services' programs for the purchase of paper and printing products containing recycled content and paper recycling. Department offices also participate in the recycling of aluminum cans generated at the work sites and in the donating of printer toner cartridges to local schools for recycling, based upon the recycling markets in each office's area.



## Florida Department of Health

The Department of Health's Biomedical Waste Program is an education-centered program guided from the Bureau of Facility Programs and implemented at a local level through strategically located county health departments. Because the Department of Health operates on the premise that an informed community is a willingly compliant community, environmental health staff train local generators, transporters, and storage and treatment facility personnel through in-service educational sessions. These educational programs include procedures for proper segregating, packaging, storing, transporting, and treating biomedical waste in accordance with Chapter 64E-16, Florida Administrative Code. Health department staff at both the state and local level are regular presenters at educational meetings for groups such as the Florida Dental Association, Florida Medical Association, Florida Professionals in Infection Control, and many others. Eighty-three educational programs were recorded on daily activity records by county health department environmental health staff with responsibilities in the biomedical waste programmatic area.

Environmental health staff spend a great deal of time providing other direct services to biomedical waste clients. Among these services are consultations, technical assistance on statute and code interpretation, reviews of operating



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plans, and evaluation of construction sites. Staff recorded 12,134 such services for the year 1999-2000. Enforcement procedures are pursued as a last resort for obtaining compliance. A total of 261 enforcement actions were coded to the biomedical waste programmatic area for the year 1999-2000. Biomedical waste complaint investigations were recorded at 695. (Chart 3)

The department has established and maintains a positive working relationship with other state agencies as well local governments and the regulated biomedical waste community. The cooperation has resulted in biomedical waste standards, which do not unduly burden the regulated community, yet adequately protect the public's health, a legislative charge administered to several state agencies. Florida's biomedical waste management program is indeed a success story of numerous governmental departments working together with the regulated community in a united effort to provide protection of the public's health.

For more information on the Bureau's Biomedical Waste Program, contact Edith Coulter, Ed Golding, or Leslie Harris at (850) 245-4277, Suncom 277-4277.

### Florida Office of Environmental Education

The 4Rs Restructuring Project. The 4Rs, which was developed in 1988-89, are K-12, interdisciplinary learning materials on solid waste management topics in Florida. 4Rs is an acronym for Reduce, Reuse, Recycle, and Recover. Since the time the 4Rs were developed, major changes in both formal education and solid waste management have taken place in Florida. The purpose of the 4Rs restructuring project is to update and improve the materials so as to meet the Sunshine State Standards and incorporate current, pertinent solid waste issues. In January 1998, a restructuring planning meeting took place on the St. Petersburg campus of the University of South Florida. Among the participants were 4Rs workshop facilitators including classroom teachers and nonformal educators, county recycling coordinators, RSP staff, and OEE staff.

The meeting resulted in a set of recommendations to guide the 4Rs restructuring project. Several key recommendations were to:

Establish linkages to the Sunshine State Standards for all new or revised learning activities;

emphasize student inquiry and discovery in the activities;

integrate various assessment methods with the activities; and

include current solid waste topics identified in OEE's 1997 survey of Florida solid waste specialists and educators.

At the meeting, OEE asked for volunteers to serve on a Materials Development Committee. Six people volunteered and were appointed to the committee.

Subsequent to the January meeting, OEE developed a funding proposal with a budget of approximately \$47,000 that would support 4Rs restructuring. The funding proposal and budget request were submitted to DOE's project administrator and to DEP's Solid Waste Management Division director for consideration. At the time, neither could commit funding support to the effort. Each, however, suggested that project funding be solicited from counties or from private businesses and organizations. OEE chose to pursue funding from private businesses, organizations and foundations. By August, the proposal had been submitted to a number of businesses, organizations, and foundations, and had received commitments of approximately \$8,500. Encouragement to proceed with 4Rs restructuring came from the funding commitments together with expressions of interest from other funding sources whose boards had not yet met to consider the funding request. A meeting of the Materials Development Committee took place in November at OEE's office. A materials writer was selected.



For more information on the Office of Environmental Education, visit:



<http://www.fldoe.org/>

## Florida Recycling Loan Program

The Florida Recycling Loan Program was created to provide access to capital for the purchase of equipment and machinery to expand recycling capacity in Florida. The program offers long-term fixed-rate loans at interest rates of up to two percent below Prime. The maximum loan amount is \$200,000. The program is limited to for-profit small businesses that are either legally licensed and operating in Florida, creditworthy start-up companies or out-of-state firms considering expansions into Florida. Eligible recycling companies must have a net worth less than \$6 million and have less than 100 employees.

Since its inception in 1995, the Recycling Loan Program has entered into eight loans totaling over \$1.3 million. The equipment purchased ranged from extruders and conveyors to tub grinders and crushers.



## Keep Florida Beautiful, Inc.

Keep Florida Beautiful, Inc. (KFB) was established by the Legislature in 1991, provided a mission, and functions as a working 501c(3) non-profit community based public/private partnership. KFB is directed by the Legislature to coordinate Florida's litter prevention programs and to assist in implementing Florida's Solid Waste Management Act. KFB was also directed by the Legislature to

coordinate Florida's statewide media educational campaign and grassroots community based efforts.

The organization serves as the umbrella for volunteer based community programs that are primarily carried out through Florida's local Keep America Beautiful Systems. KFB is the State affiliate of Keep America Beautiful, Inc. a 501c(3) non-profit founded in 1953, and works with KAB to bring national resources to bear at the local level in Florida. KFB serves as a statewide conduit for private and public sector funding participation concerning litter, and other related solid waste management issues. KFB offers organizational infrastructure for local grassroots community based volunteer programs. KFB also acts as the conduit and manages the DEP appropriation for the Approved Community-Based Program Grant.

## *Economic Development and Clean Communities*

Litter is a problem in Florida. Recent research shows litter has increased 17% and is having significant impacts on our urban areas. Research also shows us that the trashing of urban areas dramatically affects the overall quality of life of many people, that litter is a direct contributor to crime and lower property values, destroys a community's tax base, and directly contributes to overall neighborhood decline. Florida businesses that responded to a University of Florida survey in 1998 said they spent about \$2,400 annually to keep their store frontage clean. Ultimately, all citizens of Florida pay for litter and litter-related problems. The DEP survey of boaters and anglers showed that 24% of those surveyed considered "Litter on beach/water" as the "Most important problem affecting Florida's marine resources".

The public continues to express concern about trash in its communities. A recent public opinion poll conducted by Keep Florida Beautiful, Inc. revealed that 70% of Floridians feel litter is a problem in their State. Clean litter free communities benefit from economic development and many of Florida's local Keep America Beautiful affiliates are established through the support of local chambers of commerce

and local businesses because of their understanding of local economic development issues.

## Florida's Litter Program

Litter continues to be a stubborn solid waste problem that affects both Florida's community both rural and urban environment and economy. Florida's litter program involves a concentrated effort to reduce litter, marine debris and illegal dumping. For 2001, the program's focus includes grassroots public education programs and public/private partnerships coordinated by Florida's Local Keep America Beautiful Affiliates, State agencies, business, associations, civic organizations, and local government. These grassroots programs are working to build individual responsibility to local communities that work to reduce habitual and thoughtless littering and illegal dumping.

Litter can also be defined as trash that is not in its proper place. Sources of litter include: household and commercial putouts, loading docks, construction sites, uncovered trucks, marine and water sources, motorists and pedestrians. Litter is not

only the incidentally item toss to blown out, but also includes Illegal Dumping. In both urban and rural communities illegal dumping is pervasive around Florida.

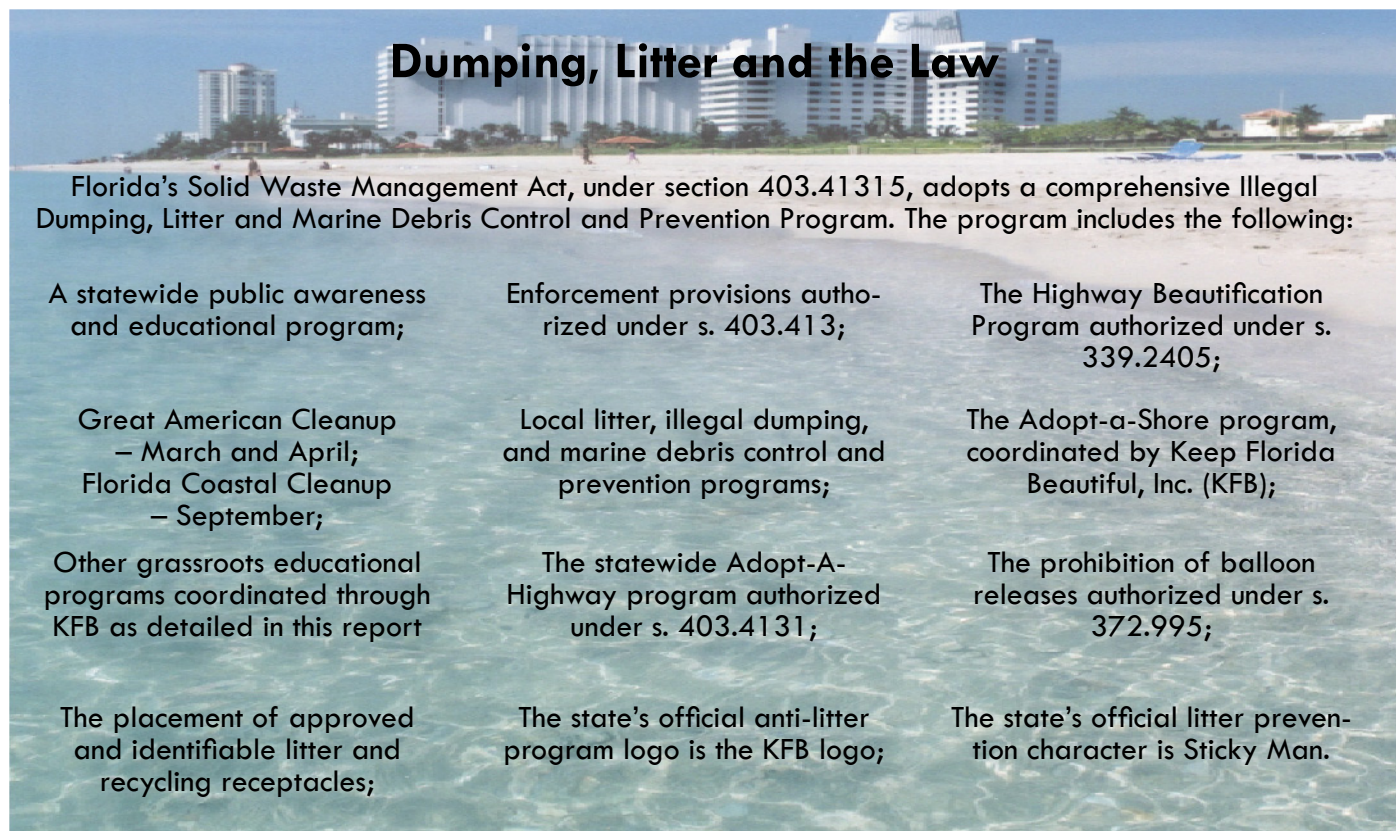
For more information about the laws regarding litter, illegal dumping and marine debris, see box below.

Although the State of Florida adopted a 50% litter reduction goal, litter is increasing, and the goal has not been achieved.

Unfortunately, the KFB plan recognizes that although adequate revenues existed in the Solid Waste Management Trust Fund, only partial funding was provided for the Statewide Anti-Litter Media Campaign for 1996-97, and none were allocated in 1995-96, some was restored from 1997-00 and eliminated once again in 2001.

### *Litter Control and Prevention Grants -- DEP*

To build the community based grassroots effort, grants are provided to counties by the Department



## Dumping, Litter and the Law

Florida's Solid Waste Management Act, under section 403.41315, adopts a comprehensive Illegal Dumping, Litter and Marine Debris Control and Prevention Program. The program includes the following:

A statewide public awareness and educational program;	Enforcement provisions authorized under s. 403.413;	The Highway Beautification Program authorized under s. 339.2405;
Great American Cleanup – March and April; Florida Coastal Cleanup – September;	Local litter, illegal dumping, and marine debris control and prevention programs;	The Adopt-a-Shore program, coordinated by Keep Florida Beautiful, Inc. (KFB);
Other grassroots educational programs coordinated through KFB as detailed in this report	The statewide Adopt-A-Highway program authorized under s. 403.4131;	The prohibition of balloon releases authorized under s. 372.995;
The placement of approved and identifiable litter and recycling receptacles;	The state's official anti-litter program logo is the KFB logo;	The state's official litter prevention character is Sticky Man.

of Environmental Protection. KFB assists in the review of these grants, which contain programs identified in the KFB Operating Plan. Counties are encouraged by the Legislature to form public/private partnerships at the community level.

### *Approved Community-Based Program Grants*

#### *-KFB*

KFB has managed and administered the pass-through grants to approved community based programs - including Florida's local Keep America Beautiful Systems (KABS). KFB distributed \$1,000,000 to 40 communities in 1999-00 for volunteer development and sustainable programs.

#### *Florida's Local Keep America Beautiful Systems (KABS)*

Currently there are 38 Certified Keep America Beautiful affiliates in Florida implementing grass-roots programs. Seven additional programs are in a pre-certified status and have received initial training. These programs follow the Keep America Beautiful philosophy of individual responsibility to improve and maintain local communities.

The cost benefit ratio average for Florida's KAB Systems is approximately \$1:\$7.09, which means that for every dollar invested by local and state government, the local private sector cash, in-kind and volunteer hours provide a match of \$7.09.

KFB estimates that more than 250,000 volunteers are currently involved in related grassroots activities, primarily coordinated through Florida's Local Keep America Beautiful Systems and the Great American Cleanup and Adopt-A-Shore and Adopt-A-Highway programs. With its mass-media efforts, KFB also estimates that the organization makes more than 1 million media impressions annually.

#### *Marine Debris and Stormwater Runoff (non-point source)*

Since many Floridians live on or around the water, what ends up on the ground is often washed into

nearby surface waters, causing water quality problems and is referred to as non-point source pollution.

Data collected reports that as much as 70% of most marine debris originates as litter on land. As local governments move forward in developing better and more sophisticated storm water treatment programs, litter is a maintenance concern that affects flooding and water quality. Litter also presents a threat to wildlife through entanglement and ingestion, besides the aesthetics issues previously mentioned. KFB's Adopt-a-Shore program addresses this issue.

#### *Illegal Dumping - Public and Private / Urban and Rural*

As tipping fees continue to rise, litter and illegal dumping also continue to increase. Litter is a problem on public lands, and as Florida continues its successful environmental land acquisition program, litter will continue to be a land management and environmental concern. Also, many large private landowners are denying public access to their lands due to liability concerns relating to illegal dumping and associated clean up costs.

#### *Enforcement*

If enforced by state and local law enforcement personnel, Florida has a tough litter control law, with many local government litter control officers. Local litter control officers often work through various local code enforcement boards. Most efforts are directed toward illegal dumping and trash accumulation on vacant land or unoccupied buildings. The penalties for violating Florida's litter law range from requiring immediate clean up and a minimum of a \$50 civil penalty up to strict criminal penalties.

Although enforcement is an important tool, in many ways litter should be perceived as a behavioral problem that does not lend itself to regulatory solutions. Education through participation is our goal.

#### *Other Community GrassRoots Programs*



Other programs provide hands-on local volunteer and funding support by empowering individual responsibility for community involved communities and solicitation of funding support for these programs.

Examples of grassroots programs include: the March-April Florida Great American Cleanup™, KFB Adopt-a-Shore program, local adopt-a-spot, road, and street programs, Trash Troopers, N.I.C.E. (Neighbors Involved in a Clean Environment) neighborhood programs, and DOT's Adopt-A-Highway program and the Sticky Man tour to schools and groups around Florida.

KFB provides training and sponsorship support, distributes program material, provides professional networking opportunities, markets Florida's network of local KAB affiliates and assists communities in the KAB certification process, coordinates the statewide campaign, administers the statewide Adopt-a-Shore program and coordinates the annual Florida Great American Cleanup.

KFB supports Florida's grassroots programs with a website <http://www.keepFLbeautiful.org> and an 800-828-9338 hotline service.



### **Southern Waste Information eXchange, Inc. (SWIX)**

The Southern Waste Information eXchange, Inc. (SWIX), a non-profit 501(c)(3) corporation formed through a cooperative partnership by Florida State University, the Florida Chamber of Commerce and the Florida Department of Environmental Protection, has as a primary objective assisting industrial and commercial waste generators with the management solid and hazardous waste.

The emphasis of the SWIX has been on encouraging and facilitating sound environmental and cost-effective alternatives to the landfilling, incineration or treatment of solid waste through direct interaction with industrial and commercial waste generators. To facilitate this objective, the SWIX Catalog is published and distributed to government agencies and private firms in the southeastern United States. The SWIX maintains toll-free hotline (1-800-441-SWIX) that is used to assist generators with their waste management needs with an emphasis on the recycling, use, and reuse of waste materials. The SWIX is a resource that can be used directly by the thousands of public and private waste generators in the southeast. The SWIX Catalog provides up-to-date information on waste materials that are “available” from as well as “wanted” by private firms and government agencies. In addition, the SWIX Catalog lists a wide range of waste management services (e.g., recycling services, collection and transportation services) which can be used by waste generators and managers.

### ***Results and Activities (July 1, 2001 – June 30, 2002):***

During 2001-2002, the SWIX received 23,843 requests for information regarding: -the availability of and demand for waste materials; - recycling, use, and reuse opportunities; -other waste management practices; - waste management services and products; and, - federal, state and local regulations that affect waste management.

Of the 23,843, requests received in 2001-2002, the SWIX received 3,020 phone calls (13%), 20,540 electronic mail inquiries (E-Mail; 86%), and 283 written inquiries (1%), requesting information concerning market development for recyclable materials, recycled products, and the reuse and recycling of waste materials. This is a 27% increase in the number of request from the previous year.

- The SWIX Web Site received 327,060 hits from 16,059 visitor sessions. This is an increase of 10% in hits from the previous year.
- As a result of the activities of the SWIX it has



been reported that approximately 53,063 tons (from 245 exchanges) of waste materials (with an estimated cost-savings in reduced disposal costs to waste generators of \$5.9 million) were successfully recycled, used, or reused.

- The Cost Benefit Ratio Average for this period is approximately \$1:20 which means that for every dollar invested in the operation of the SWIX program, \$20 was avoided in disposal costs to waste generators.
- The direct financial benefits to waste generators and users resulting from reduced operating costs associated with these materials is substantial. Of even greater importance are the environmental benefits made possible by having this material diverted from landfills or incinerators through the increased levels of recycling, use, and reuse.

In addition to helping meet the state and federal regulatory requirements, participation in the SWIX program provides industrial and commercial waste generators as well as governmental agencies an opportunity to explore alternative waste management options which could result in significantly reduced operating costs and increased protection of the environment. The SWIX program represents an important waste management service protecting the environment through recycling and material reuse.



## The Florida Center for Solid and Hazardous Waste Management (The Center)

The Florida Center for Solid and Hazardous Waste Management (The Center) is located at the University of Florida in the College of Engineering. The Center serves the citizens of

Florida by providing leadership in the field of waste management research and by supporting the Florida Department of Environmental Protection (FDEP) in its mission to preserve and protect the state's natural resources.

The Center's functions include: responding to the state's waste management research needs by coordinating and sponsoring research efforts at Florida's universities; responding to requests for information and technical assistance from state and local government, business and industry; and responding to public education and public service needs.

### *The Research Program*

The Center receives an annual appropriation from the Legislature. The Center serves as a catalyst for the procurement of additional funding to meet Florida's waste management and research needs. Since its inception, the Center has sponsored more than 100 research studies involving 120 students at nine different universities in Florida. The Center has contracted with 46 principal investigators to conduct these projects.

The Center's research program is designed to meet two major objectives:

- To develop and test innovative, low-cost, and environmentally sound methods and strategies for managing Florida's solid and hazardous wastes; and
- To transfer research results to the public and private sectors for practical solutions to Florida's waste management problems.

The Center sponsors research at public and private universities and colleges in Florida accredited by the Southern Association of Colleges and Schools, including: Florida Atlantic University, Florida A&M University, Florida Institute of Technology, Florida State University, University of Central Florida, University of Florida, University of Miami, University of South Florida, and the University of West Florida.

## Center Sponsored Research Projects

The Center sponsored the following projects during the previous two fiscal years:



### Construction and Demolition Debris

- C&D Waste Landfills in Florida: Assessment of True Impact and Exploration of Innovative Control Techniques.  
*Dr. Timothy Townsend, University of Florida*
- Generation and Composition of Construction and Demolition Waste in Florida  
*Dr. Debra Reinhart, University of Central Florida, Dr. Timothy Townsend, University of Florida, and Dr. Howell Heck, Florida Institute of Technology*

### Hazardous Waste Management

- Environmental Impacts of Lead Pellets at Shooting Ranges in Florida (Year 3 of 3)  
*Drs. Lena Ma and Willie Harris, University of Florida*

### Electronics

- Feasibility of Recycling Electronic Products via a Continuous Low-Cost Process.  
*Dr. Charles Beatty, University of Florida*

### Landfills

- Assessment of Alternative Earthen Final Covers for Florida's Landfills.  
*Drs. Tarek Abichou and Kamal Tawfiq, Florida State University*

- Compatibility of Incinerator Ash-Soil Mix as an Alternative Material for Landfill Liners and Covers  
*Dr. Alaa Ashmawy, University of South Florida*

### Solid Waste Management

- Risk, Trust, and Uncertainty: Public Opinion and its Role in Siting Solid Waste Facilities.  
*Drs. Renee Johnson and Michael Schiccatano, University of Florida.*



### Special Wastes

- Treated Wood: Evaluating Toxicity During Disposal (Year 5 of 5).  
*Dr. Helena Solo-Gabriele, University of Miami and Dr. Timothy Townsend, University of Florida*
- Environmental Impacts of CCA-Treated Wood.  
*Dr. Helena Solo-Gabriele, University of Miami and Dr.*

*Timothy Townsend, University of Florida*

- Long Term Mobility of Chromated Copper Arsenate Components in Florida Soils.  
*Dr. Jacob Huffman, University of Florida and Dr. Jeffrey Morrell, Oregon State University*



- Design and Operational Issues Related to the Co-disposal of Sludges and Biosolids in Class I Landfills  
*Drs. Debra Reinhart and Manoj Chopra, University of Central Florida and Dr. Timothy Townsend, University of Florida*

- CCA-Treated Wood: Life Cycle Analysis and Fate  
*Dr. Helena Solo-Gabriele, University of Miami and Dr. Timothy Townsend, University of Florida*

- Leaching Tests for Evaluating Risk in Solid Waste Management Decision Making  
*Dr. Timothy Townsend, University of Florida*

The Center's research agenda is broad, encompassing both technical and social elements. The Center recognizes that its efforts must be of a pioneering nature and that its resources should be used primarily for activities that extend the frontiers of knowledge about solid and hazardous waste management. The research program focuses on critical state issues important to industry and local and state government.

Principle research areas include: Environmental Justice, Hazardous Waste Management, Incineration, Landfills, Medical Waste Management, Municipal Solid Waste Management, Waste Reduction, Pollution Prevention, Recycling and Reuse, Socioeconomic Concerns, Special Wastes, and Construction and Demolition Debris. Copies of the research reports can be downloaded from the Center's web site [www.floridacenter.org](http://www.floridacenter.org) and are also available upon request.



## Center Conducted Research Projects

The Center conducted the following research projects during the previous two fiscal years.

### *Bioreactor Landfill Demonstration Project*

The Center initially received a 3.2 million-dollar grant from the FDEP and the Florida Legislature to design, construct and operate a bioreactor landfill demonstration project. Subsequently, FDEP has increased the original allocation 2.25 million-dollars, bringing the project total to 5.45 million-dollars. The purpose of the project is to determine whether or not bioreactor landfills can be operated cost effectively at a working scale landfill.

Bioreactor landfills are a relatively new technology and have several advantages over traditional landfills. They are designed to operate in a manner that causes the municipal solid waste to decompose very rapidly. Bioreactor landfills have the potential to store higher loads of garbage than other landfills of comparable size. The objective is to maintain an environment that allows micro-organisms to breakdown organic matter (paper waste, food waste, and yard trimmings) through recirculation of the leachate.

### **The objectives of the landfill bioreactor demonstration are to:**

- Design and operate the bioreactor using innovative techniques and concepts.
- Design and operate the bioreactor in a manner to control and measure the major inputs and outputs.
- Instrument the landfill bioreactor to permit in-situ monitoring of bioreactor activity and to measure previously unmeasured information (e.g. leachate head on the liner).
- Monitor the bioreactor in a manner to measure the impact of bioreactor activities and to allow control of the waste treatment process (e.g. leachate and gas composition and generation, waste characteristics, settlement).
- Collect data through instrumentation, field monitoring, and laboratory analysis that will enable the project team to assess the success of the project, the feasibility of this technology for other sites, and to enable the future design and operation of landfill bioreactors in Florida.
- Develop standardized design and operation procedures for this technology.
- Further define and quantify the true costs and benefits of landfill bioreactors.

The Bioreactor Landfill Demonstration Project is coordinated through the University of Florida (Dr. Timothy Townsend), the University of Central Florida (Dr. Debra Reinhart), and the New River Regional Landfill. Project management is provided through the Florida Department of Environmental Protection (Mr. Fletcher Herrald).

### *Bioreactor Landfill Moisture Management, University of New Orleans*

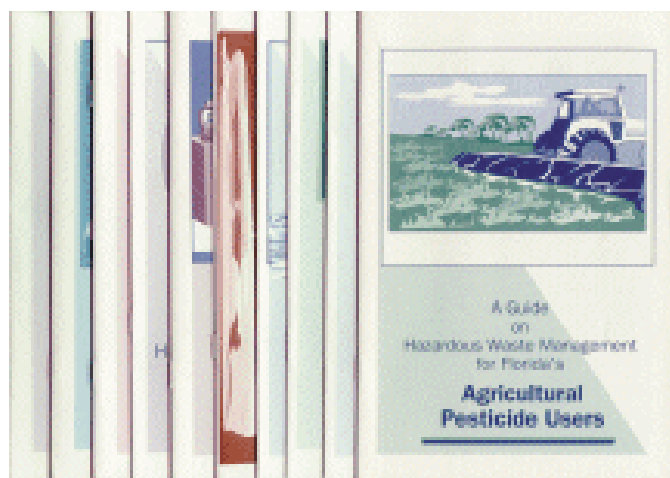
Under a contract with the Urban Waste Management and Research Center at the University of New Orleans, the Center continued its research on bioreactor landfill moisture management. The project includes investigators from the University of Central Florida (Dr. Debra Reinhart), the University of Florida (Dr. Timothy Townsend) and the University of Alberta in Canada (Dr. Chris Zeiss).

### *Phytoremediation of Contaminated Sites by Woody Biomass*

Under subcontract with the Center, Dr. Donald Rockwood, University of Florida/IFAS School of Forest Resources and Conservation continued his study on the effectiveness of various trees and woody plants in cleaning up soil and groundwater contamination at former industrial sites. Researchers evaluated and quantified the potential of various plant species to efficiently extract toxic chemicals and heavy metals from contaminated soils.

### *Assessing the Impact of Chromium in the Environment*

Under contract with the Center, Dr. Timothy Townsend, University of Florida, and Dr. Helena Solo-Gabriele, University of Miami, are developing a guidance document that will help regulators assess the impact of chromium in the environment.



Assessing the proper disposal options for chromium-containing wastes requires a distinction between chromium (III) and chromium (VI). It is necessary to determine the environmental factors that cause chromium to change its oxidation state.

### *RCRA Projects*

#### **• Brochures**

One of FDEP's goals is to assist small businesses in complying with RCRA. With funds provided by the US EPA, FDEP contracted with the Center to produce a series of reader-friendly, industry-specific brochures as an educational tool. The brochures have been mailed to approximately 60,000 Florida businesses. FDEP staff and local government environmental staff have distributed more than 30,000 of the brochures. The 11 brochures that have been developed target agricultural pesticides users, auto repair shops, dry cleaners, fiber-reinforced plastics (boat & spa) manufacturers, furniture refinishers, laboratories, paint and body shops, photo shops, printed circuit board manufacturers, printers, and pharmaceutical companies. The Center has embarked on a task to update three brochures each year, as selected by the FDEP.

The brochures can be downloaded from the Center's web site at: <http://www.floridacenter.org>.

#### **• Best Management Practices (BMP)**

The Center developed a best management practices handbook for the management of wastes produced at shooting ranges. The Center and the FDEP co-hosted the first meeting of the Florida Shooting Range Initiative. Approximately 50 participants from across the United States attended the meeting.

The BMP can be downloaded from the Center's web site at: <http://www.floridacenter.org>.

#### **• Effects of Compost on Arsenic Leachability in Soils and Arsenic Uptake by a Fern**

Drs. Aziz Shiralipour and Lena Ma, from the University of Florida, collected experimental data evaluating arsenic uptake by a fern plant and the effects of compost in reducing arsenic leaching into



the groundwater.

### • Environmental Fate and Management of Lead at Shooting Ranges in Florida

Dr. Lena Mac conducted leachability testing on fresh and weathered lead shot/bullets, fractionation and bioavailability testing on soil samples, and mineralogical analysis on soil samples. The researchers

concluded that

physical abrasion of lead bullets passing through soil contributes significantly to lead contamination in shooting ranges. This research clearly demonstrates that lead contamination (elevation of lead concentrations in soils) as well as lead transformation (from inert metallic lead to more reactive lead compounds) in shooting range soils occurs rapidly in newly opened ranges. Therefore, it is important to employ best management practices to minimize the adverse impacts of lead at all shooting ranges, regardless of their ages.

### *Florida Litter Study*

The Florida Legislature in 1993 charged the Center with conducting annual litter surveys to measure progress toward the state's 50% litter reduction goal. In 1997, the Center reported that based on four annual roadside litter surveys, litter had increased by 17% in Florida. The roadside litter survey continued in 2001 and 2002.

Although not the only places where litter accumulates, roadsides are a useful indicator of

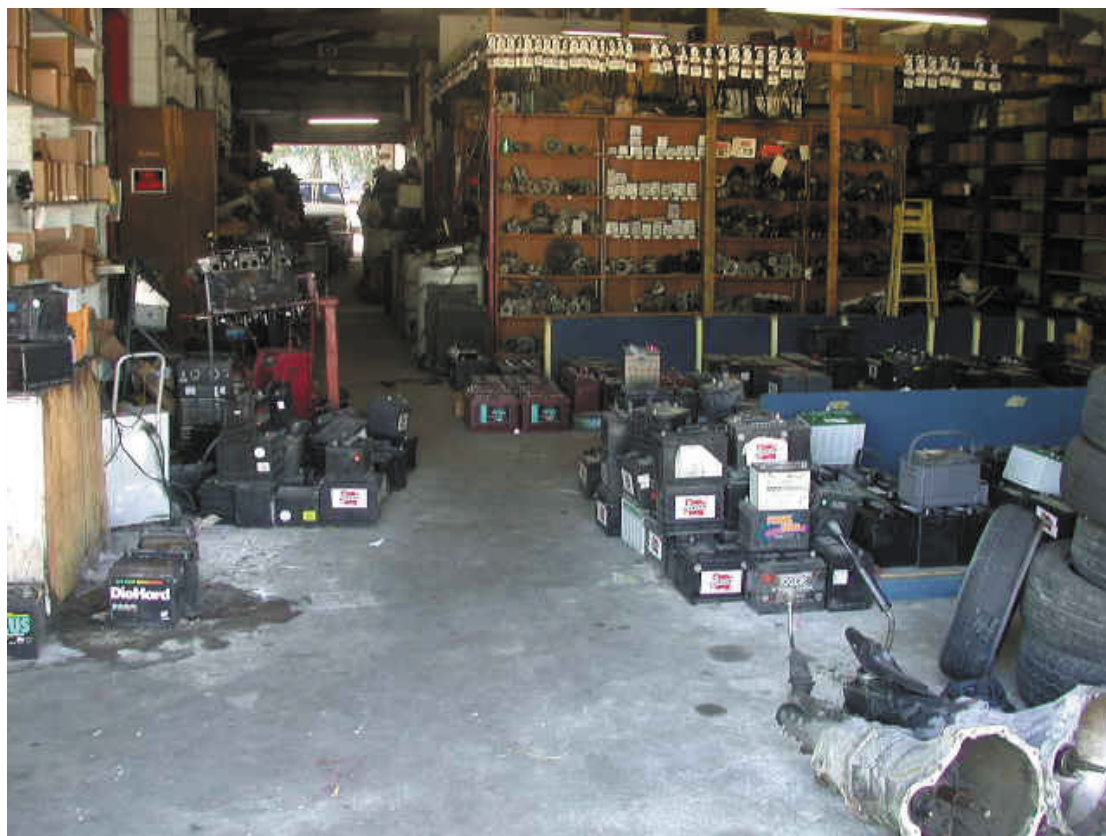


Photo of a typical Small Quantity Generator (SQG) storage area

Photo: The Center

the amount of litter in the environment. Items or pieces of items four square inches or larger in size were classified as "large litter," and items or pieces under four square inches were classified as "small litter." Due to Florida's need to mow frequently, most of the small litter items identified are broken or mulched pieces of large litter. Cigarette butts accounted for 24-33% of small litter items during the first five years of the roadside litter survey, and in 2002 this was about the same (25.92%). Of the two classifications, large litter warrants more concern.

Following the baseline survey in 1994, surveys conducted in 1995 and 1996 suggested that the amount of litter on Florida's roadsides remained fairly constant. In 1997, the survey indicated a statistically significant (17-18%) increase in the amount of large litter items found on Florida's roadsides. After three years in which no roadside survey was conducted, the 2001 survey found an estimated 15-16% decrease in large litter from 1995. However, the current survey results show an estimated 4-18% increase from 1995 to 2002, a 2-14% increase from 1996 to 2002, a 38-65%

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decrease from 1997 to 2002, and a 17-30% increase from 2001 to 2002.

### *Small Quantity Generator Training Curriculum*

The Center developed a training curriculum and corresponding material for regional training workshops for FDEP's Small Quantity Generators' Assessment, Notification and Verification Program coordinators. A reference CD was developed also to accompany the curriculum workbook.

### *Street Sweepings*

An eighteen (18)-month contract with FDEP and multi-sponsors was executed to test and analyze street sweepings. This project is a collaborative effort of FDEP, 12 municipalities, and researchers from the University of Florida. The research was conducted by Dr. Timothy Townsend at the University of Florida.

### *Current Sponsored Research Projects*

The Center is currently conducting research in the following areas:

#### **Hazardous Wastes**

- Update of Recommended Management Practices Guide for Removing Hazardous Materials from Demolition Projects.

*Dr. Timothy Townsend, University of Florida*

#### **Landfill Issues**

- Control of Odors from Construction and Demolition Debris Landfills.  
*Dr. Debra Reinhart, University of Central Florida and Dr. Timothy Townsend, University of Florida*

- Decentralized Landfill Leachate Treatment Systems that Produce Reusable Water for On-Site Irrigation.  
*Dr. William Cooper, Florida State University*

- Bioreactive Landfill Cover Systems.

*Drs. Tarek Abichou and Danuta Leszczynska, Florida State University*

- Design of Cost-Effective Lysimeters for Alternative Landfill Cover Demonstration Projects.  
*Drs. Tarek Abichou and Kamal Tawfiq, Florida State University*

#### **Special Wastes**

- Extent of CCA-Treated Wood Used for Commercial Mulch.  
*Dr. Helena Solo-Gabriele, University of Miami and Dr. Timothy Townsend, University of Florida*

- Developing Retention Indices and Modeling Transport of CCA in Florida Soils at Unlined Landfills.  
*Drs. Clayton Clark, Tait Chirenje, Michael Annable, Kirk Hatfield and Lena Ma, University of Florida*

- Assessment of True Impacts of E-Waste Disposal in Florida.  
*Dr. Timothy Townsend, University of Florida*

- Investigation of Production and Beneficial Use Practices of Fossil Fuel Combustion Wastes in Florida.  
*Dr. Angela Lindner, University of Florida*

### *Current Center Research Projects*

The Center will conduct the following research projects during the 2002-2003 fiscal year.

#### **Bioreactor Project**

The construction of the bioreactor at the New River Regional Landfill (NRRL) has reached substantial completion. Data gathering will continue. Leachate sampling and analysis has begun. Surface settlement is being tracked through GPS surveying. Temperature measurements are recorded from thermocouples located throughout the landfill. Gas measurements are collected from throughout the landfill. Gas flow measurement will begin. The first phase of the research will involve collection of

background data and preparing for isolated tests of the vertical leachate injection wells.

Project web site: <http://www.bioreactor.org>.

### **Bioreactor Landfill Moisture Management - University of New Orleans**

The objective of this research is to monitor and evaluate moisture movement and moisture balance in a bioreactor landfill operated under parallel aerobic and anaerobic conditions, something never before accomplished. Landfill leachate management can be one of the biggest challenges encountered by landfill managers. Bioreactor operation offers landfill managers opportunity for leachate storage, treatment and disposal. Although in situ moisture is a critical parameter to the success of bioreactor operations, it is one of the most difficult to accurately measure. This project provides an opportunity to evaluate available technology in a recirculating landfill environment. Data collection from the field sensors at the Orange County Landfill will continue. With the initiation of water/leachate addition planned at the New River Regional Landfill, water balance data will be collected from the MTG and TDR sensors.

## **RCRA**

### **• Brochures**

To assist businesses in complying with RCRA regulations, the Center has begun revision of the laboratories, agricultural pesticide users and fiber-reinforced plastic manufacturer brochures. Center staff will coordinate the design and printing of 12,000 guides, as well as the statewide distribution of the publications.

### **• Effect of Compost on Arsenic Leachability in Soil and Arsenic Uptake by a Fern (Phase 3)**

Drs. Aziz Shiralipour and Lena Ma, University of Florida will collect experimental data evaluating arsenic uptake by fern plants and the effects of compost in reducing arsenic leaching into the groundwater.

### **• Management and Disposal Options for CCA-Treated Wood Waste**

Dr. Helena Solo-Gabriele, University of Miami, will evaluate the various management and disposal scenarios for discarded CCA-treated wood. Disposal scenarios will include those that have been practiced in Florida, such as incineration at co-generation plants, recycling as mulch, and disposal in C&D landfills. Other possible options will include disposal through pyrolysis, pyrogenesis, or other incineration processes, and/or disposal through municipal solid waste landfills or other lined landfills. Recycling options, including the extraction of the CCA chemical and incineration of “clean” wood fiber, recycling of the discarded wood into wood-cement composites, or recycling into wood-based composite materials, will also be examined.



Grinding yard waste Photo: Bill Hinkley