

**EVALUATING CONTAINER DEPOSIT  
LEGISLATION PROPOSED FOR KENTUCKY  
(House Bill 371)**

Research Report No. 288

*Legislative Research Commission  
Frankfort, Kentucky  
November, 1999*

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**SPECIAL TASK FORCE ON CONTAINER DEPOSIT**

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# FOREWORD

House Bill 371 of the 1998 Session directed the Special Task Force on Container Deposit to study whether or not container deposit legislation will improve the present structure of solid waste management in the Commonwealth of Kentucky, and achieve that improvement with the least disruption of the present structure. The Task Force was also authorized to make recommendations for legislative proposals to strengthen the state's waste management programs. This Task Force report, the product of that study, concludes with no formal recommendations.

Staff of the Legislative Research Commission prepared the report and their assistance to the Task Force is gratefully acknowledged.

Robert Sherman  
Director

The Capitol  
Frankfort, Kentucky  
December, 1999



# TABLE OF CONTENTS

FOREWARD .....	i
SUMMARY .....	v
I. TASK FORCE CREATION AND PURPOSE .....	1
II. BACKGROUND .....	3
National Level .....	3
State Strategies .....	4
Kentucky Solid Waste Management .....	6
III. TASK FORCE FINDINGS .....	9
House Bill 371 .....	9
Potential Problems of Bill .....	10
Distrubution Process of Grocery Stores .....	10
Center for Business and Economic Development Study .....	12
Bottling Industry .....	13
Advance Disposal Fees .....	15
Other Bottle Bill States .....	15
IV. LITTER CONTROL METHODS .....	21
Adopt a Highway .....	21
Advance Disposal Fees .....	22
Education Programs .....	22
Enforcement Activities .....	23
Grant Programs .....	24
Inmate Litter Crews .....	25
Keep America Beautiful .....	26
Pollution Prevention .....	27
Regional Recycling Centers .....	27
Returnable Bottles .....	28
V. LITTER SURVEYS .....	29
Kentucky Beverage Industry Recycling Program .....	29
Solid Waste Coordinators of Kentucky (SwaCK) .....	30
Kentucky Transportation Cabinet .....	31
University of Kentucky .....	31
VI. OTHER FINDINGS .....	33
Markets of Recyclables .....	33
Trends in Packaging Materials .....	34
FOOTNOTES .....	35

## **LIST OF TABLES**

Table 1. Sales Tax on Groceries for Kentucky and Bordering States .....	11
Table 2. Impact of Product Prices on Industry.....	12

# **SPECIAL TASK FORCE ON CONTAINER DEPOSIT**

## **SUMMARY**

The Special Task Force on Container Deposit was created to study container deposit legislation and whether such a policy would benefit Kentucky. The Task Force was composed of members representing various and competing interests who were brought together to discuss a highly divisive issue.

The Task Force worked diligently to master this complex topic. Members vigorously debated elements of container deposit laws and solid waste management in general. They gathered an impressive amount of information, which is presented in this report.

Information was collected from individuals whose livelihoods revolve around beverage containers, whether in the form of a manufactured product or roadside litter. Testimony was received from policy makers and agency officials from Kentucky and other states. At times, information was presented to the Task Force as rebuttal to a previous presentation. As a result, Task Force members sifted through information that was often contradictory. Still, the information and testimony received provided Task Force members with a better understanding of the various and competing perspectives regarding container deposit issues.

From the lengthy Task Force discussions came several observations about what would benefit and complement Kentucky's solid waste management program. While not formal recommendations, these observations and ideas merit reference since they reflect the workings and discussions of the Task Force. These ideas include:

1. A mandatory garbage collection program that would require residents to subscribe to a collection service or provide proof that they use a transfer station to dispose of garbage;
2. An amended ethics law to allow private and public partnership for Keep America Beautiful, Adopt a Highway, and other environmental and litter cleanup programs;
3. A requirement that private recycling facilities join the practice of publicly owned facilities in reporting on the volume of recycled material collected;
4. Funding for the existing recycling grant program through a 50¢ tipping fee at landfills to finance capital costs and the development of a recycling infrastructure;
5. Education programs and statewide curriculums for classroom use on conservation, litter, and recycling;
6. Expansion of curbside recycling programs;

7. Stricter enforcement of current litter laws;
8. A requirement that the Natural Resources and Environmental Protection Cabinet coordinate litter control and recycling efforts with other state agencies and nonprofit or volunteer groups;
9. Establishing a 1-800 hotline to report litter, illegal dumping, and unsecured loads of transported solid waste;
10. Distributing Public Service Announcements that target litter and recycling;  
and
11. Continuing to appropriate money to the Kentucky Pollution Prevention Center to assist industry in waste reduction and reuse activities.

Specifically regarding container deposit legislation, ideas were brought forth during Task Force discussions, or by individuals testifying to the Task Force, about provisions that should be considered in drafting container deposit legislation. These ideas include:

1. One-time financial aid to small businesses to cover costs of switching labels on beverage containers to be sold in jurisdictions with container deposit legislation;
2. Allowing out-of-state individuals who have purchased beverages in Kentucky to redeem containers after showing proof of purchase in Kentucky;
3. Keeping the provision for county redemption centers, with the option of allowing them to be run by the private sector;
4. Stricter criminal penalties for fraudulent redemption;
5. Requiring state universities to perform research and development on secondary products made from recycled materials to stimulate market development;
6. A public awareness campaign of the container deposit system during the first year of implementation; and
7. Inclusion of containers made from future packaging materials.

This report is organized into four major sections including a background of solid waste activities nationally and statewide, a discussion of container deposit legislation, a discussion of litter control methods besides container deposit programs, and results of litter surveys taken in Kentucky. Two additional sections include discussions of markets for recyclables and the future of plastics.



## **CHAPTER I**

# **TASK FORCE CREATION AND PURPOSE**

House Bill 371, enacted by the 1998 General Assembly, created the Special Task Force on Container Deposit. The original provisions of the bill proposed deposits on beverage containers and advance disposal fees on fast food containers to reduce litter and encourage recycling.

The Task Force was charged by the General Assembly to review ways container deposit legislation may improve the present structure of solid waste management in Kentucky and achieve that improvement with the least disruption of the present structure. Also, the Task Force was authorized to make recommendations for legislative proposals to strengthen the state's waste management programs.

Members of the Task Force mandated by House Bill 371 included: the primary sponsor of the bill; four members of the General Assembly selected by the Legislative Research Commission, two of whom are members of the Interim Joint Committee on Agriculture and Natural Resources; a student representative of Estill County High School; a representative of the Natural Resources and Environmental Protection Cabinet; a representative of the Department of Local Government; a representative of the Kentucky League of Cities; a representative of the Kentucky Association of Counties; a representative of the Kentucky Chapter of the Solid Waste Association of North America; a representative of the Kentuckians for the Commonwealth; a representative of the Kentucky Resources Council; a representative of the Beverage Industry Recycling Program; a representative of the Kentucky Retail Federation; a representative of the food service and packaging industry; a representative of the Kentucky Beer Wholesalers Association; two members selected by the Legislative Research Commission to represent nonalcoholic beverage bottlers; a representative of the Kentucky Farm Bureau; a representative of the League of Kentucky Sportsmen; a representative of the Kentucky Grocers Association; and a representative of the Kentucky Scrap Processors and Recyclers Association.

On July 8, 1998, the Legislative Research Commission approved the membership of the Task Force.

The Task Force began monthly meetings in September, 1998, and met nine times.



## **CHAPTER II**

# **BACKGROUND**

Container deposit laws, or “bottle bills” as they are popularly known, currently exist in 10 states and one city. The rationale behind container deposit laws is that an economic incentive will encourage consumers to recycle beverage containers and consequently discourage littering.

A typical container deposit program requires retailers to pay a five cent deposit for beverage containers purchased from distributors. Consumers are, in turn, required to pay the retailer this deposit when the beverage is purchased. The deposit is redeemable at retail locations, redemption centers, recycling centers, or other special locations. Usually, the distributors pay retailers or redemption centers a handling fee of one to three cents for each container redeemed. Because not all containers are returned, the unclaimed deposits (the escheat) become a source of revenue. In seven states with container deposit legislation, the distributor receives the unclaimed deposits while in two states, the money is used for environmental programs and grant funds, and in one state, the money is split between environmental programs and handling fees.

Even though the container deposit issue is not a new one, debate continues on the effect of such a policy on society. Most arguments can be separated into two groups: Those that contend that container deposit programs hurt industry, and those that contend that without these programs the environment suffers. The evidence offered by both sides of the debate is often conflicting.

The Task Force began its deliberations with overviews of solid waste management at the national and state levels. Traditionally, the federal role in municipal solid waste management has been to conduct research, establish national standards, resolve interstate issues, address international issues, and delegate authority and provide support to states.

The state role in municipal solid waste management has been to establish goals and standards, fund research, issue permits, monitor compliance, enforce rules, support waste reduction and recycling, and provide public education programs.

At the local level, the role of city and county government has been to plan solid waste management, provide for collection and disposal services, finance infrastructure and programs, enforce requirements, institute land use planning and zoning, educate, and monitor and report on programs.

## **National Level**

The federal government first addressed municipal solid waste management with the enactment of the Solid Waste Disposal Act in 1965. This legislation attempted to promote sanitary landfills as an alternative to open dumps and open burning. In 1976, this legislation was amended by the Resource Conservation Recovery Act (RCRA) which created the first comprehensive regulatory program for the systematic control of household garbage and hazardous waste.

As more information about the health and environmental impacts of waste disposal became available, Congress revised RCRA in 1980 and in 1984. Increasing standards for constructing and upgrading landfills made the landfill business more expensive, and many landfills closed, leading to a reduction of landfill space across the country. For instance, the number of landfills in the United States declined from approximately 9,000 landfills in 1984 to 3,100 landfills in 1996. With fewer landfills available, recycling became a means of diverting material from the waste stream.

One of the most recent developments at the federal level in municipal solid waste management to have a profound impact on local waste management involves flow control issues. Flow control laws allow state and local governments to designate facilities to which solid waste generated within their jurisdictions must be taken. In general, its purpose is to guarantee that projected amounts of waste (and revenues) would be received at waste management facilities funded by revenue bonds. Such laws have been overturned in recent years by several federal courts, including a 1994 decision by the U.S. Supreme Court.

Consistently since 1978, the federal courts have also held that shipments of waste are protected under the interstate commerce clause. As a result, state and local governments may not prohibit private landfills from accepting waste from out-of-state, nor impose fees on waste disposal that discriminate on the basis of origin. Currently, states are seeking authority from the federal level to control the amount and type of incoming waste.

## **State Strategies**

States use a number of programs to handle municipal waste, the most popular ones being curbside recycling and “pay as you throw” programs. States target different components of the waste stream to recycle, and consequently, use different programs to achieve their goals such as a bottle bill to target beverage containers.

Of the states that have recycling goals, six have surpassed that goal including Florida, Georgia, Illinois, Maryland, Oklahoma, and Virginia. Fifteen states have recycling goals at 50% or higher, and most have targeted the year 2000 as the date to achieve that rate. Rhode Island has the highest recycling goal of 70%, but is far from achieving it as in 1996, its recycling rate was 14%. States with the highest recycling rates include Minnesota with 46% of all municipal solid waste being recycled, and New Jersey with 45% of

municipal solid waste and 60% of total waste being recycled. Wyoming and Washington, D.C. have the lowest rates at 5% and 8% respectively, mainly because these states do not offer curbside recycling.

States typically do not set penalties for themselves if they do not meet their recycling goals. Occasionally, localities will establish recycling goals that differ from the state goal, but again, penalties are not widespread for failure to meet goals. However, in California, if counties did not meet the 1995 recycling rate goal of 25%, the California Integrated Waste Management Board which oversees that state's recycling effort could explore the possibility of assessing fines. On the other hand, many states offer incentives to counties that meet the state recycling goal. In South Carolina, if a county met both a reduction and recycling goal by May of 1997, then the county was eligible for a bonus grant; 9 out of 46 counties met the goals and received the grant.

**Waste Reduction.** States use various strategies to achieve recycling. Recently, the focus has been upon "waste reduction" where the strategy is to reduce the generation of waste first, then recycle what remains. States using the waste reduction strategy include California, Colorado, Georgia, Indiana, Iowa, Michigan, North Carolina, and North Dakota. Typically, these states set a base line year such as 1990 against which to measure the increase or decrease of waste.

**Pay As You Throw.** Several states are using unit pricing and variable rate pricing for garbage collection to encourage waste reduction. "Pay as you throw" programs set garbage collection rates by weight or by a set price per garbage bag set out for collection. The customer benefits by reducing the amount of waste produced and paying a lower garbage collection fee. The United States Environmental Protection Agency endorses this approach and considers it environmentally and economically sustainable, and equitable. Communities that use "pay as you throw" report substantial increases in recycling and waste reduction.

**Waste to Energy.** Another strategy is the "waste-to-energy" approach where states reduce the amount of waste in their stream by using waste as a source of fuel. While realizing the benefits of a more diversified energy resource, pollution emission is a concern as incineration of waste can emit heavy metals, such as mercury and dioxin, into the atmosphere.

**Container Deposits.** A fourth approach to recycling involves container deposits in which a consumer is required to pay a deposit on a beverage container, and the consumer is refunded the deposit when the bottle is returned for recycling.

Currently, 10 states and one city have container deposit programs including California, Connecticut, Delaware, Iowa, Maine, Massachusetts, Michigan, New York, Oregon, Vermont, and Columbia, Missouri. Container deposits can have a large impact on boosting a state's recycling rates. The 10 states with bottle bills recycle more tons of beverage containers than the other 40 states combined.

Areas actively seeking container deposit legislation besides Kentucky include Washington, D.C. and Bermuda. Also, efforts have been made in the United States Congress to enact a national bottle bill. However, several industry concerns surround bottle bills, including the costs associated with sorting, storing, and transporting containers, as well as lost beverage sales and fraudulent redemption.

**Tax Credits.** Several states and localities offer credits on sales, income, or property taxes to companies that are in the business of recycling or use recycled material, or that purchase recycling and pollution control equipment. Twenty-two states have recycling tax credit programs. The criteria for awarding tax credits vary across states. Some states offer tax credits depending on the number of jobs created or based on the amount of capital invested, while some states offer tax credits to recyclers of specific materials in order to target a certain kind of waste.

However, states are moving away from tax credits because they are too costly. Income tax credit programs have fallen from 21 in 1993 to 10 today. Instead, states are offering grant and loan programs and free technical assistance.

## **Kentucky Solid Waste Management**

KRS 224.43-340 requires counties to develop and implement solid waste management plans to address municipal solid waste management needs for the area. Additionally, counties are required to submit annual reports. The Task Force received information about solid waste management activities across Kentucky based on 1997 annual reports.

Kentucky law requires each county to provide universal collection for all households or solid waste generators in the county. Universal collection simply means that all households have *access* to a disposal method, which may include door-to-door household collection, or direct haul to convenience centers or transfer facilities. Mandatory collection requires households and solid waste generators to *participate* in solid waste collection programs. All 120 counties have universal collection, and of these, 20 counties have mandatory collection. Door-to-door collection is the primary system in 109 of the counties, and the average monthly bill is \$10.26.

Kentucky has 25 contained landfills currently operating with tipping fees ranging from \$26 to \$46 per ton. In addition, there are approved construction permits for six more municipal solid waste landfills. Kentucky has 140 less than one acre construction/demolition debris landfills, and 20 greater than one acre construction/demolition debris landfills.

Illegal dump clean-up is an important component of the solid waste management plans. Between 1993 and 1997, 9,963 illegal dumps were cleaned up at a total cost of \$13.4 million. The Natural Resources and Environmental Protection Cabinet has been aggressive in investigating illegal dumps, resulting in 453 dumps being cleaned by

violators. One Task Force member suggested expanding mandatory garbage collection throughout the state to aid in decreasing the number of illegal dumps.<sup>1</sup>

Fourteen counties and 28 cities offer door-to-door recycling. Kentucky has 82 publicly owned and 70 privately owned drop-off centers in 112 counties. A drop-off center may not have a full and closed system of processing capabilities with a constant market for the material. The Natural Resources and Environmental Protection Cabinet conducted a telephone poll of the 112 counties with drop-off centers, and 81 counties responded. This telephone poll revealed that 24 counties have no processing capabilities in their drop-off centers, while 57 counties have some processing capabilities.

Kentucky has 191 recycling facilities, places where materials are accumulated, processed to some degree, and transferred to markets. Eight-five of these facilities are government-owned. Of the total 191 facilities, 78% accept aluminum, 38% accept plastic bottles, and 33% accept glass bottles. In addition, Kentucky has 6 regional recycling centers and several private sector industries provide regional recycling. The actual amount of material recycled at these facilities is difficult to gauge, as Kentucky requires only county-owned facilities, not private recycling facilities, to report on the volume of recycled material collected. One Task Force member suggested that Kentucky's reporting requirements be changed to require private recycling facilities to submit recovered material reports.<sup>2</sup>

KRS 224.43-010(4) set a goal of reducing the amount of municipal solid waste disposed in landfills by 25% by July, 1997 as compared to fiscal year 1993. According to the Natural Resources and Environmental Protection Cabinet, this goal was not met because of progress made on mandates increasing collection, cleaning up illegal dumps, and disposal of natural disaster debris. Recycling data shows that an amount equal to 28% of our municipal solid waste generated and disposed in Kentucky in fiscal year 1997 was recycled.





## CHAPTER III

# TASK FORCE FINDINGS

### House Bill 371

House Bill 371 would have required a five cent deposit on beverage containers less than 20 ounces, and a ten cent deposit on containers greater than 20 ounces. Beverages covered under the container deposit law would have included soft drinks, beer, wine, liquor, milk, juice, water, teas, and sports drinks. The bill also would have required a \$.0025 advance disposal fee on fast food cups and containers, and would have given the Natural Resources and Environmental Protection Cabinet the authority to place another one cent fee on non-beverage containers that have low recycling value.

Under the bill, consumers would pay the deposit when purchasing a beverage, and redeem the deposit when the container is returned to a state approved redemption center. Local governments would have been responsible for providing redemption centers in each county.

House Bill 371 would have used unclaimed deposit money to pay a two cent handling fee to the recycling center for each container redeemed, so in essence, this money would have been returned to the county. The advance disposal fee would have been distributed to counties based on the number of road miles per county, and the funds were earmarked for litter pick-up programs.

### Potential Problems of Bill

The Task Force began its deliberation of House Bill 371 by discussing problems with the language and mechanics of the bill, and potential problems that could arise with implementation of the bill.

**Additional Disposal Fees.** House Bill 371 does not specify criteria by which the Natural Resources and Environmental Protection Cabinet can determine if non-beverage containers have a low recycling value, thereby having the potential to affect a majority of non-beverage products.

**Cross Border Shopping.** A container deposit places beverages at a competitive price disadvantage with those products in border states without container deposits. Consumers in border areas may choose to purchase their beverages, and subsequently other products, in border states.

**Fraudulent Redemption.** Container deposit legislation gives rise to fraudulent redemption of containers in border areas of the deposit state. Consumers purchasing

beverages out-of-state would come to Kentucky to recycle the container and attempt to receive the deposit.

**Handling Fees.** Because the handling fee is paid from unclaimed deposits, that source of money is depleted when the recycling rate reaches 71% for five cent containers, or 83% for ten cent containers. An alternative means of paying handling fees would have to be developed for the system to be successful.

**Inconvenience of Redemption.** Redeeming containers can be inconvenient, particularly for the elderly or for people without transportation. In rural counties, a consumer may have to travel several miles to access a redemption center.

**Job Loss.** Beverage manufacturers and grocers maintain that container deposit legislation will lead to job loss in their industries as manufacturing costs increase due to the purchase of new equipment and facilities to implement the program, and consumers purchase fewer products to avoid paying the deposit.

**Markets for Recyclables.** Concern over flagging markets for glass and plastic raised questions about the viability of a policy that promoted the recycling of those commodities. If a material were being collected that had low recycling value, and markets were difficult to find for that material, the material could be stored indefinitely in the recycling facility. This situation could lead to shortages in storage space and cause the material to be landfilled before markets for it were found.

**Need for Infrastructure.** At least 24 counties are without processing facilities, and these counties would need to acquire land, construct a recycling facility, purchase a baler, and hire workers to operate a recycling program. Thus, the infrastructure needed to run a container deposit program is not in place statewide. Under House Bill 371, moneys are given to counties for solid waste management after the deposit program has started and only after any borrowed general fund moneys have been repaid to the state treasury.

**Waste Stream.** Beverage containers and fast food litter comprise 3-5% of the total solid waste stream. A recycling or litter control program that encompassed additional types of products would divert more waste from the landfills.

These issues were examined in more detail throughout the course of the Task Force meetings and are revisited later in this report.

## **Distribution Process of Grocery Stores**

In the last 10 to 20 years, a number of changes have occurred in the grocery industry. First, the industry has consolidated brand production by limiting production of a particular brand to one or two plants nationwide. Secondly, distributors have eliminated or reduced unprofitable stock keeping units, or SKUs, which are various sizes of a particular brand of product. Third, better inventory control at the manufacturing and distribution

level has minimized inventory and increased efficiency. Fourth, the industry has moved to eliminate double-slotting, a condition where a warehouse, manufacturer, or retailer has to keep two separate bins for the same product. Finally, the industry has seen an increased use of multi-state distribution systems.

When a product is manufactured, it leaves the plant and goes to a distribution system of wholesalers around the country. This distribution system is made up of national, regional, and state distribution points. A product will go through at least three distributions as it works its way to the retail level. Forty-six distribution points around the country serve Kentucky grocers.

Beverage containers marked for redemption in other states are sold in all 50 states because it is the most cost effective and efficient way to distribute those products. Problems arise with fraudulent redemption when products stamped with an exclusive state redemption label are sold in other states. With segregated systems and double-slotting, distribution costs are passed along to consumers.

A 1997 Food Marketing Institute report states that a grocery store averages 1% net profit on its sales. To remain in operation with this profit margin, a grocery must move large quantities to a large number of customers. The industry has substantial fixed costs, and is both plant and equipment intensive. Fixed costs include rent, utilities, and property taxes. One controllable expense a grocery has is labor – how much help is in a store, and how many hours are used to stock shelves. Like other industries, groceries operate on productivity measurements, and sales are calculated per work hour. The Food Marketing Institute reports an average of \$111.79 sales per labor hour for groceries nationwide.<sup>3</sup>

The main issue for grocers is how to remain competitive. If a container deposit adds \$1.20 to a case of soft drinks, the price increase could result in consumers' shopping elsewhere, which would eventually lead to a loss of jobs for the affected grocery. For this reason many grocers oppose container deposit legislation.

However, with no sales tax on groceries, Kentucky would likely remain competitive with border states that do have a sales tax on groceries if container deposits were enacted (see Table 1).

**TABLE 1**

<b>Sales Tax on Groceries for Kentucky and Bordering States</b>		
<b>State</b>	<b>Sales Tax on Groceries*</b>	<b>Annual Tax Paid on Groceries**</b>
Illinois	1%	\$ 28.76
Indiana	0%	\$ -
Kentucky	0%	\$ -
Missouri	1.225%	\$ 35.23
Ohio	0%	\$ -
Tennessee	8.25%	\$ 237.27
Virginia	4%	\$ 100.66
West Virginia	6%	\$ 172.56

\* Source: Federation of Tax Administrators.11

Under a traditional bottle bill, in which beverage containers are redeemed at the place of purchase, retailers may attract repeat business by redeeming beverage containers. Additionally, retailers can offer reverse vending machines that redeem beverage containers and offer a credit voucher in return to be used at grocery stores. These machines save on the retail establishment's storage space while attracting customers to the stores.<sup>4</sup>

### **Center for Business and Economic Development Study**

The Center for Business and Economic Research (CBER) at the University of Kentucky prepared a study entitled *The Economic Impact of a Container Deposit Program in Kentucky* for the Kentucky Grocers Association. This study examined the impact of a container deposit program on existing sales and employment in food stores in Kentucky. The study also examined the effects of a container deposit program along Kentucky's borders where consumers have the option of purchasing groceries in other states. Finally, the study examined the impact of container deposits on the revenue stream of redemption centers, and the potential impact of such legislation on state tax revenues.

CBER found that container deposit legislation could lead to substantial losses in sales, employment, and worker earnings in groceries in Kentucky due to higher prices on products and a subsequent loss of sales (see Table 2). CBER estimated there would be \$100.7 million less in grocery sales, and 691 less full-time equivalent jobs in grocery stores in the first year after container deposit legislation was implemented.

CBER reported that approximately 60% of the state's population reside in 48 border counties. CBER suggested that with container deposit legislation, Kentucky residents would do their major shopping for household products and groceries in adjacent states, leading to a reduction in total purchases at Kentucky stores. CBER estimated that the impact of cross border shopping under a container deposit system would be an additional loss of \$118.1 million in sales and 826 full time equivalent jobs for the grocery industry in the first year following enactment (see Table 2).

**TABLE 2**

<b>Impact of Product Prices on Industry</b>				
<b>Product</b>	<b>Lost Sales (in millions)</b>	<b>Lost Jobs</b>	<b>Lost FTE Jobs</b>	<b>Lost Worker Earnings (in millions)</b>
Soft Drinks	\$54.1	436	371	\$7.1
Beer	30.9	249	212	4.1
Other Beverages	15.7	127	108	2.1
Non-Beverages	8.9	71	61	1.2
With 1 cent ADF on cups	9.4	76	65	1.2
With 1 cent ADF on containers	2.4	44	38	0.5
In Border Counties	118.1	970	826	15.5
KY Soft Drink Industry	-	224	224	8.8
<b>Total</b>	<b>239.5</b>	<b>2,199</b>	<b>1,905</b>	<b>40.3</b>

Center for Business and Economic Development

CBER compared the income and expenses for redemption centers that would operate under House Bill 371 to determine whether the 2 cent per container handling fee would cover the cost of operating a redemption center. Redemption centers have overhead expenses of property, equipment, and storage. Operating expenses include labor, utilities, and hauling costs. CBER estimated that overall, redemption centers statewide would lose \$5.9 million per year to redeem beverage containers if they received a 2 cent per container handling fee and sold the material collected. If non-beverage containers were included, an additional \$24.3 million would be lost by redemption centers. CBER suggested that redemption centers would need significant subsidies to operate.

Finally, CBER estimated the impact of container deposit legislation on state tax revenues. Because beverages are subject to sales tax, lost beverage sales would impact sales tax revenues. Lost sales of alcoholic beverages would impact the wholesale excise tax, and lost worker earnings would impact income tax revenues. The total combined loss in tax revenue from these sources is estimated to be \$12 million per year.

A brief evaluation of the CBER study by the LRC staff economist's office determined that "the scope of the CBER report is not sufficient to provide a complete assessment of the 'economic impact . . . in Kentucky' of the reviewed legislation."<sup>5</sup> Further, the LRC economist found that factors that would likely offset the estimated negative economic effects were not considered, and that the report presents an estimate of gross costs rather than net costs. Finally, the LRC economist questioned specific estimation methods used by CBER to quantify consumer costs and consumer responses to those costs, including assumptions about how House Bill 371 might be implemented, and the method used by CBER to estimate sales reductions in border counties.

In response to the LRC staff economist evaluation, CBER stressed that it did not conduct a benefit-cost analysis that examined social welfare benefits and costs of container deposit legislation. CBER states that it produced an economic impact report that is of use to policy makers who consider changes in employment when evaluating public policies.<sup>6</sup>

## **Bottling Industry**

Representatives of the beverage manufacturing industry maintain that container deposit legislation will lead to lost sales and force bottling companies out of business. They cite examples of Pepsi's experience in Iowa and Massachusetts after those states enacted bottle bills. In Des Moines, Iowa, sales decreased 9% after the bottle bill became effective, costing a total of 15 jobs.<sup>7</sup> In Massachusetts, one company's sales decreased 8.2% in the year following enactment. Since enactment of Massachusetts bottle bill, the number of soft drink distributors decreased from 32 to 12, and the number of beer distributors dropped from 43 to 28 in that state.<sup>8</sup> In both states, it took five years for the companies to get soft drink sales back to pre-bottle bill levels. Also, beer sales in Iowa reportedly decreased, and in border counties those sales dropped by 17-19%.<sup>9</sup>

Other data suggests that in Iowa, beer sales declined 2% during the first 9 months following implementation of the bottle bill, and then either increased or remained steady for the next 5 years. Additionally, some 1200 jobs were created with an annual income of \$17,000 to \$21,000 as a result of the law.<sup>10</sup>

One particular concern of small bottlers is the cost of updating a label to include Kentucky's container deposit and redemption information. A small bottler may carry 115 different packages consisting of cans, glass, and plastic. A small company may not be able to absorb the cost of the basic art charge to change a label, or the cost of stopping the production line to switch labels out.

The Owens Illinois Label plant in Bardstown estimated that updating labels with a Kentucky redemption would increase their labeling costs by 18%. High end labels that would require two labels would cost \$3.6 million, and low end labels would cost \$1 million. This would be the total cost for revising 2500 to 3000 soft drink labels that go on plastic bottles.

One suggestion offered by Task Force members was to provide a one-time payment to small businesses for transition costs of implementing container deposit legislation. This limited state aid could assist companies with one-time costs of switching out labels on beverage containers.<sup>11</sup>

In traditional bottle bill states, consumers redeem containers at retail establishments and distributors are required to pick up the empty containers. Under this type of system, distributors pay a handling fee to retailers for each container. In these states, the issue of fraudulent redemption affects the pocketbook of bottlers and distributors. The Massachusetts State Auditor estimates that waste, fraud, and abuse cost bottlers and distributors \$3.7 million per year. The bottling industry fears that fraud would be worse in Kentucky because House Bill 371 includes more beverage products than the Massachusetts bottle bill. In Maine, where deposits are required on noncarbonated beverages, redemption rates are 150% or higher in some border areas, and unclaimed deposits have been used to reimburse refunds paid in excess of deposits collected.<sup>12</sup>

Another concern of the beverage industry is that container deposit legislation would address a small percentage of roadside litter and of the solid waste stream.

An opposite point of view suggests that instead of looking at how much of the waste stream is being targeted, it is better to focus on how to reduce the loss and waste and taxpayer expense of this component of the waste stream. For example, Kentucky has dealt with waste tires through a Waste Tire Program, which addresses only a portion of the waste stream. Similarly, newspapers have been singularly targeted in previous Kentucky legislation. Container deposit legislation seeks to boost the recycling, recovery, and reuse rate for the beverage container component of the waste stream.

Still, representatives of the beverage industry believe that beverage products are unfairly targeted, and that a more comprehensive waste reduction approach would be

more cost effective and efficient than a container deposit system. As alternatives, the industry supports curbside recycling, stricter enforcement of litter laws, mandatory garbage collection, education and promotional programs, and Adopt a Highway programs.<sup>13</sup>

### **Advance Disposal Fees**

House Bill 371 proposed a ¼ of one cent advance disposal fee on fast food cups and containers sold in Kentucky. The theory behind advance disposal fees is that the cost of waste management of a product should be borne by the manufacturer and conveyed to the consumer in the product's price. Thus, an advance disposal fee provides an incentive for both the manufacturer and the consumer to consider waste management in their product selection decisions. The money generated with an advance disposal fee is then used for solid waste management activities.

Dart Container Corporation (Dart) operates two plants in Kentucky, one in Owensboro and one in Horse Cave. Dart manufactures foam cups and containers. Dart submitted testimony to the Task Force based on the assumption that it would be responsible for an advance disposal fee of ¼ of one cent on each container, plus a "low recycling value" fee of one cent as designated by the Natural Resources and Environmental Protection Cabinet on non-beverage container products. These two fees combined would double the cost of producing a foam cup, which is currently between 1/8 of one cent and one cent. Such production costs would force Dart to leave Kentucky.

However, the advance disposal fee was intended to be placed at the retail level, not at the manufacturing level. Dart estimates that a fast food restaurant pays anywhere between two and four cents for each cup used.

The provision of House Bill 371 authorizing a one cent fee for non-beverage products with a low recycling value lacks specificity and as currently drafted, has the potential to affect a wide variety of products, including ketchup bottles and butter tubs. It was not intended to be placed on fast food cups or containers.<sup>14</sup>

### **Other Bottle Bill States**

The Task Force examined bottle bill programs in three states: California, Iowa, and Massachusetts. Individuals from these states shared their perspective of and experience with container deposits. They indicated that several of the problems identified with House Bill 371 were used as arguments against container deposit legislation in their respective states, but many of these arguments were proven unfounded.

Cross border shopping may have occurred in California, Iowa, and Massachusetts following enactment of container deposit legislation. However, if it has occurred, it has been at undetectable levels as cross border shopping has not been identified as a major issue in any of these states.<sup>15</sup>



Fraudulent redemption does occur in each of these states, but not at levels that undermine the fiscal strength of the programs. Steps have been taken in these states to guard against fraudulent redemption, or to provide incentives to the beverage industry to reduce fraudulent redemption. One suggestion to prevent fraudulent redemption in border areas in Kentucky is to require customers to show proof of purchase in Kentucky when redeeming containers.

Regarding handling fees, none of these three states have handling fees set up in the way that House Bill 371 proposed. Under the proposed bill, a two cent handling fee would be paid on each container from the unclaimed deposit fund. One of the criticisms of the bill is that the unclaimed deposit fund would run out of money if over 71% of the containers under 20 ounces were redeemed and 83% of the containers 20 ounces or more were redeemed. In California, Iowa, and Massachusetts, the beverage industry is responsible for paying handling fees or similar fees. Thus, the unclaimed deposit fund in these states is fairly substantial. In California and Massachusetts, the unclaimed deposit is used for grants to non-profit agencies and environmental programs. In Iowa, the distributor receives the unclaimed deposit to offset handling fees.

The individuals from these states indicated that job loss has not been a problem in their respective states. Rather, these three states experienced a growth of jobs in the recycling industry, in food stores that offered container redemption, and in manufacturing jobs of companies that used recycled material as feedstock. Any job loss in the beverage industry by distributors should not be singularly attributed to container deposit legislation.<sup>16</sup>

Individuals from these states agreed that convenience of redemption was the key to container recycling success. Each of these states offers conveniently located redemption centers, or have retailers redeem containers. In Iowa, retailers opt to redeem beverage containers as a way to attract consumers back to stores.<sup>17</sup>

Finally, each of these states has experienced a reduction in roadside (and in California and Massachusetts, coastline) litter, an increase in beverage container recycling, and reduced costs of litter cleanup.

### **California**

In 1986, California enacted the Beverage Container Recycling and Litter Abatement Act (the Act) to aid in litter reduction, energy conservation, and the establishment of a recycling ethic. The Act placed a 2.5 cent deposit on containers less than 24 ounces, and a 5 cent deposit on containers 24 ounces or larger.

California's container deposit program includes beer and other malt beverages, soft drinks, wine and distilled spirits, carbonated mineral water, and soda water. Containers are returned to redemption centers rather than to the retailer. Some centers are located in



convenience zones that operate within a ½ mile circle of supermarkets with annual sales in excess of \$2 million.

Originally, convenience zones, or supermarket zones as they are known, received handling fees to establish and maintain those facilities. As of January 1, 1999, convenience zones no longer receive handling fees. Prior to the Act, around 375 recycling facilities existed. Today those facilities total around 1,000. In addition, 1,100 supermarket zones exist.

The most contentious issue surrounding California's program is the processing fee, also known as the manufacturer's responsibility. The purpose of this fee is to make manufacturers responsible for and to internalize the cost of recycling their product. If a container does not have enough intrinsic scrap value to cover the cost of collecting, sorting, processing, and transporting to a market of end use, the manufacturer pays the difference in cost. This was intended as an incentive to develop markets for container types, and to encourage manufacturers to reuse their containers.

Manufacturers and distributors in the beverage industry did not lose jobs as a result of the bottle bill. In the recycling industry, roughly 3,000 jobs were created by the California program.<sup>18</sup>

California is bordered by 4 states and one country. Fraudulent redemption is a major issue. The state employs 6 investigators that oversee recycling centers. A paperwork trail is established for recyclers so that recyclers know whose containers are being redeemed. Recyclers issue receipts or keep a log of redemption's that contain the name, address, and driver's license number of the redeemer. The U.S. Department of Justice and Department of Agriculture assist the state by stopping truckloads of containers at weigh stations and borders stations to fill out paperwork on the origin of their containers so that if trucks go to recycling centers, they will be traced as out-of-state and the containers are not redeemed.

California also restricts the number of containers that can be redeemed in a month by an individual. Recyclers cannot purchase or redeem more than 250 pounds per individual per month. This provision prohibits tractor-trailer loads of containers from being redeemed.

In 1987, the recycling rate in California was 50%. In 1988, the recycling rate was 67%. In 1992, it was 82% and since then it has declined to almost 76% in 1997. Today, curbside recycling co-exists with the container deposit system. Markets for recyclables are significantly better today than prior to the bottle bill.

## **Iowa**

In 1979, Iowa's Beverage Container Deposit Law became effective, placing a 5 cent deposit on beer and other malt beverages, soft drinks, wine and distilled spirits, carbonated mineral water, and soda water. At the time, the legislature had a choice of a

deposit law or a container tax. The beverage industry preferred the tax, but the bottle bill prevailed with the support of the Republican governor.<sup>19</sup>

Under this system, the distributor collects 5 cents from the retailer who collects the deposit from the consumer. Retailers or redemption centers redeem the containers, and distributors pay the retailer/redemption center the five cent deposit plus a one cent handling fee. If the container is not returned, the distributor keeps the unclaimed deposit. Every county in Iowa has a redemption center, but retailers usually provide redemption as a convenience to the consumer, and to attract customers.

The recovery rate for aluminum is 95% and the rate for glass is 85%. The recovery rate for plastic fluctuates between 70% and 90%. In addition to a container deposit, Iowa has added curbside recycling to its solid waste management program. Also, landfill waste has been reduced 40% by a mandatory paper recycling program. Since the container deposit law has been in effect for 20 years, a generation of children has grown up with recycling and has developed an environmental ethic towards recycling.

Studies show that the cost of beverages is competitive with border states. People in border states take advantage of Iowa's zero sales tax on groceries, and purchase their groceries in Iowa.<sup>20</sup> Also, several jobs have been created in the recycling industry. For instance at supermarkets, redemption centers have been set up in front of stores so money can be given to customers before they begin shopping.

Iowa farmers reportedly saved \$37 million in damages to crops and machineries as a result of the bottle bill. Agriculture interests support the law because it prevents fields from being littered and prevents containers clogging up tractor equipment.<sup>21</sup>

A study by the University of Northern Iowa shows the law is popular with an 85% approval rating, and has broad based support across the demographic spectrum.<sup>22</sup> Also, total roadside litter was reduced 38% and beverage container litter was reduced 79% in the law's first year, thereby reducing roadside maintenance costs.<sup>23</sup> Still, in 1996 the Iowa Department of Transportation spent \$716,000 for litter pickup, indicating that litter still occurs along the highways.<sup>24</sup>

## **Massachusetts**

The Massachusetts Beverage Container Recovery Law was enacted in January of 1983 after a stormy legislative history and two governor vetoes. The bill placed a 10 cent deposit on soft drinks and beer 32 ounces or greater, and a five cent deposit on these same products less than 32 ounces.

Originally, bottlers and distributors received any unclaimed deposits, or escheatage money. However, in 1990 a Clean Environment Fund was established and the escheatage is now used for municipal recycling programs and solid waste or hazardous waste issues.

A unique provision about Massachusetts' program is that wholesalers are required to put money upfront in a Deposit Transaction Fund from which container deposits are withdrawn based on monthly sales reports.

The program's environmental and economic benefits range from \$47 million to \$73 million each year. Environmental and health benefits include substitution of recycled material for virgin raw material and decreased pollutants from reduced processing of raw material; less solid waste; reduced litter; less health costs resulting from cuts due to broken glass; and reduced greenhouse gas emissions in the production of raw material. Economic benefits include new employment opportunities, reduced garbage costs, and reduced solid waste management costs. Tertiary benefits include providing a fund raising tool for schools, and a source of pocket money for the homeless.<sup>25</sup>

Estimated costs to the distributor and bottler to implement the Massachusetts program total \$1 per case for beer. This cost includes front-end costs as well as recycling costs. For soft drinks, that cost is estimated to range from 70 cents to \$1. Because the distributor pays the retailer a handling fee, the distributor can lose money if the container is not worth the handling fee. Some costs are passed along to the consumer.<sup>26</sup>

Other costs include the loss of deposit money for consumers who do not redeem their containers, and costs associated with fraudulent redemption's. Fraud occurs primarily in redemption centers by overreporting redemption levels and in border areas by redemption of containers purchased out-of-state. Also, fraud occurs in reverse vending machines when individuals place containers that were purchased out-of-state into the machine. However, the technology exists for vending machines to read bar codes, and some northeastern states are actually using it. However, this technology may require double-slotting at the manufacturing and distribution levels.<sup>27</sup>

Finally, container deposit legislation is popular in Massachusetts with 85% to 90% approval rates. Similar figures favor expanding the program to cover teas, juices, sports drinks, and water. However, expansion efforts face heavy opposition from the beverage industry.<sup>28</sup>

## **Michigan**

Michigan pursued its container deposit legislation through a petition drive that gathered 400,000 signatures to place the measure on the November ballot in 1976. With a 64% approval rating, Michigan voters approved the bottle bill, and it went into effect in December of 1978.

The law placed a 10 cent deposit on beer, soft drinks, carbonated water, and mineral water. In 1988, Michigan United Conservation Clubs (MUCC) successfully pushed to amend the legislation to include wine coolers and mixed drinks.

Originally, bottlers and distributors kept any unclaimed deposits. However, a recent court case determined that the state is the rightful owner of the unclaimed deposits, and

the industry was ordered to pay the state \$45 million. Now, 75% of the unclaimed deposit goes to an environmental fund to clean up contaminated sites, and 25% of the money goes to the retailer that redeems containers.

Several studies have examined the effect of container deposit legislation in Michigan. The General Accounting Office compared the number of jobs lost and created because of the bottle bill, and found a net gain of 4,888 new jobs. The Michigan Department of Transportation found in 10 years, beverage container litter was reduced 80%, resulting in a 38% reduction in total roadside litter. The Center for Marine Conservation found that Michigan has the lowest percentage of bottles and cans in coastal litter, at 3% compared to 17% nationwide.<sup>29</sup>

Before Michigan's bottle bill was enacted by voter referendum, the Michigan legislature had debated and defeated container deposit legislation. The legislature was provided scientific and economic information showing that a container deposit system would significantly hurt beverage sales, would cost hundreds of jobs, and would lead to significant problems with fraudulent redemption. None of these situations occurred at the drastic levels at which they were predicted to occur.<sup>30</sup>

## **CHAPTER IV**

# **LITTER CONTROL METHODS**

The General Assembly gave the Task Force the latitude to recommend legislative proposals to strengthen Kentucky's solid waste management program. During the course of its meetings, the Task Force learned of programs besides container deposit systems that can reduce litter and encourage recycling.

### **Adopt a Highway**

The Task Force learned about West Virginia's Adopt a Highway program that has been successful in promoting and maintaining cleaner roadsides. West Virginia's program began in 1988 through a joint operation by the Department of Transportation and the Department of Natural Resources and is the only such program that is a cooperative effort between two state agencies. Kentucky has an Adopt a Highway program operated by its Department of Transportation. However, there is no dedicated funding mechanism for Kentucky's program.

West Virginia's Adopt a Highway program is funded through \$1 that is added to each vehicle registration every year. The Department of Natural Resources administers the program which entails promoting the program, printing brochures and promotional materials, recruiting volunteers, and keeping statistics of the litter cleanup programs. The department requires groups to fill out a report card after each cleanup to track aluminum, glass, and paper collected along the roadsides.

West Virginia has 1,550 organizations participating with 29,000 members. These volunteers have cleaned 3,905 miles of highway in the state out of a total of 32,000 adoptable miles. Six district coordinators help recruit volunteers to adopt highways. Volunteers have identified fast food as the most prevalent type of litter, followed closely by beverage containers.

The program sponsors two statewide cleanups each year and asks groups to clean up roads during those campaigns. Incentives such as key rings, reusable drink bottles, certificates, a statewide picnic, and a letter from the governor are offered to keep volunteers interested in the program. Since 1988, volunteers have picked up 44 million tons of litter from roadways. The program is advertised through public service announcements, billboards, and group press releases.

West Virginia's Adopt a Highway program is developing a hotline to report litter violations. Currently, if someone reports the license plate of a vehicle that is a source of litter, Adopt a Highway mails a letter to the owner of the vehicle stating that an occupant of that car was seen littering. This has been an effective attention-getting tactic.

In 1990, Operation Wildflower began as a result of the Adopt a Highway program. Using public donations and district Department of Transportation operating budgets, flowers are planted along interstates and interchanges that bloom from May to November. A ½ acre site can be planted for \$225, or a full acre for \$450. The site is cultivated and maintained by the Department of Natural Resources for three years. Most sites are donated in memory of another person. A sign recognizing the program is placed on the site and maintained by the Department of Transportation. The rationale behind Operation Wildflower is that motorists will not litter roadsides that contain scenic beauty.

### **Advance Disposal Fees**

One grocer recommended to the Task Force an advance disposal fee in lieu of container deposit legislation. A one cent fee on a variety of products, including fast food packaging and newspapers, was believed to generate approximately \$100 million. The grocer testified that this type of program is more comprehensive than container deposit legislation, and places the financial responsibility of litter reduction on other industries besides the beverage industry.<sup>31</sup>

### **Education Programs**

The Task Force learned about West Virginia's successful education programs, including its Youth Conservation and Make It Shine programs.

**Youth Conservation Program.** The Youth Conservation Program has existed for 36 years and is currently comprised of 690 youth groups or clubs and 74,000 members. The program is co-sponsored by the Department of Natural Resources and around 30 private companies. Groups participate in projects such as managing wildlife, planting flowers, picking up litter, recycling, educating others, feeding birds, teaching boat and gun safety, and cleaning hiking trails. Cash awards provide incentive for participation.

The Department sponsors "Youth Day" in May at a West Virginia state park where awards are presented. Activities include free camping, programmed events, exhibits, free box lunches, a dance, and a vesper service. Also, a Junior Conservation Camp is offered for children age 11-14, and a Youth Environmental Conference offered for children age 13-18. Last year over 500 youth attended the camp and conference.

Funding for awards, Youth Day, Junior Conservation Camp, and the Youth Environmental Conference comes from donations from businesses, coal companies, organizations, foundations, banks, and solid waste authorities. Six environmental coordinators around the state provide outreach to schools and civic organizations and promote various programs throughout counties and highway districts. Funding for salaries, travel expenses, printing and postage is paid from the Department of Natural Resources General Revenue Fund.

**Make It Shine Program.** This program began in 1991 to promote awareness, stewardship, and knowledge of West Virginia’s natural resources. The program also focuses on clean up of illegal dumps. The program uses a three-pronged approach of education, stewardship, and cleanup.

For its education component, Make It Shine provides handbooks to schools and pamphlets for the general public. It performs press and media alerts on topics such as reducing junk mail and reducing waste at Christmas, and produces a newsletter on solid waste. To combat litter, Make It Shine distributes promotional material such as pencils, lapel pins, and litter bags.

Environmental stewardship, or a pat on the back for appreciation, is another important part of Make It Shine. There is a Clean County Contest offering cash awards to communities, and a Make It Shine Community Award program where communities are given road signs designating its “Make It Shine” status. Awards are presented annually at the Governor’s Conference on Environmental Education or at recognition ceremonies organized for volunteers.

The third component, cleanup, is the physical removal of illegal trash and debris. April is Make It Shine month, and several state government agencies and civic organizations work with the Department of Natural Resources to organize and carry out mass cleanup efforts across the state. Groups will send in registration forms for their projects, and are provided with bags and gloves, heavy equipment, hauling services, landfill disposal fees, educational materials, and media releases. In addition, Make It Shine promotes two clean river sweeps each year.

The annual budget of Make It Shine is \$100,000, which comes from the Recycling Assistance Fund. This fund is generated through an assessment fee of \$8.25 per ton of waste disposed at landfills, of which \$2 goes to the Recycling Assistance Fund.

## **Enforcement Activities**

Kentucky’s litter law imposes a \$500 fine and/or imprisonment up to 12 months for a person guilty of criminal littering. A judge or jury has the discretion to impose additional or alternative penalties, which may include pickup and removal of trash in areas designated by the court (KRS 224.99-010). Litter includes rubbish, refuse, waste material, offal, paper, glass, cans, bottles, trash, debris, or foreign substance. Criminal littering occurs:

- On a public highway when a person drops or permits to drop any destructive or injurious material and does not immediately remove it (KRS 433.753 and 512.070);
- On any public or private property or in any public or private water when a person knowingly places or throws litter without permission (KRS 512.070);



- On public water when a person negligently places or throws glass or sharp objects in or near public water, or discharges sewage, minerals, oil products, or litter into public waters (KRS 433.757 and 512.070); and
- Within a cave when a person places any refuse, garbage, dead animals, sewage, toxic substances, or other similar materials in a cave (KRS 433.875).

Kentucky has a mixture of law enforcement personnel policing solid waste violations, and the law enforcement varies by county. Some counties use the sheriff's department, while other counties deputize the solid waste coordinator, who may issue citations. Other counties have no enforcement. Each state police post has an environmental state police officer that will lend support to counties and to the Natural Resources and Environmental Protection Cabinet for investigations. One problem with enforcing Kentucky's litter law is that it is difficult to catch people in the act of littering.

Several Task Force members suggested that Kentucky's litter laws need stricter enforcement. One proposal presented to the Task Force recommended setting up a toll free hotline for citizens to report litter, illegal dumping, and unsecured loads.<sup>32</sup>

## **Grant Programs**

The Task Force learned about a grant program promoting recycling that has been successful in West Virginia. It also received a suggestion for a grant program in Kentucky funded from an increased tipping fee at landfills.

**West Virginia Recycling Program.** West Virginia's recycling program provides assistance to municipalities, counties, and the private sector through grant programs. Again, the Recycling Assistance Fund, which comes from a portion of the fee assessed at West Virginia's landfills, is used to fund the recycling program. An entity that disposes of its waste outside of the state, and therefore does not pay the assessment fee, is not eligible to participate in the grant program.

Last year, the recycling program awarded 34 recycling grants totaling \$1.37 million to be used for recycling equipment and property. Instead of one lump sum payment, grants are awarded on a 30-30-30-10 basis of four payments. The state has the right to repossess the equipment if recycling is discontinued. A second component of the recycling program is the Office Recycling Program, which picks up paper at 125 state office locations.

Legislation is being proposed in West Virginia this year for a bulky goods program for solid waste haulers. Haulers would be able to add 50 cents to monthly trash bills to take away bulky goods at no additional charge. A second law being proposed would allow Department of Natural Resources conservation officers to enforce West Virginia's mandatory collection law.

Currently, \$24,000 is generated annually from the enforcement of litter laws, and the recycling program receives only a portion of this money.



**Tipping Fees.** KRS 224A.280 established a grant program for Kentucky counties to fulfill solid waste management plans. Other than a one-time grant of \$50,000 in 1992, counties have not received any additional grant moneys under this statute. Currently, Kentucky is one of 13 states that does not provide grants to local governments for solid waste management.

One proposal presented to the Task Force recommends that a 50 cent per ton tipping fee be assessed for every ton of in-state and out-of-state waste disposed in a Kentucky landfill. Revenue generated from this fee would be placed in Kentucky's existing grant program for solid waste management. The grant money would enable counties to establish recycling programs, obtain infrastructure needed to support recycling, and develop education programs for the public about recycling and reducing litter. It is estimated that a 50 cent per ton tipping fee will generate \$3.75 million annually for a grants program.

Disposal of out-of-state waste in Kentucky has been increasing since 1995. For the most part, Kentucky's landfills are owned by larger companies. Many of these companies are already paying similar fees in other states. Currently, Indiana has a 50 cent tipping fee, while Tennessee has an 80 cent tipping fee.

Kentucky's disposal fee is low in comparison to other states, ranging from \$16 to \$46 a ton. In-state competition keeps these fees low. Rates are lower in Western Kentucky than in Eastern Kentucky because the terrain in Western Kentucky makes it more economical to construct landfills. The further east you move, the higher the landfill rates become.

Kentucky does offer low-interest loans for local governments to start recycling centers through the Kentucky Infrastructure Authority. However, due to the price fluctuation and instability of the recycling market, local governments are uncertain how to repay the loan, and therefore unwilling to borrow money.

### **Inmate Litter Crews**

Butler County is one area of the Commonwealth that successfully uses inmate labor from the local jail on roadcrews to pick up trash from the roadsides. Inmate labor is an affordable alternative for counties that require routine roadside cleaning sweeps, requiring only safety vests, gloves, trash bags, and a low-cost insurance policy for the inmates.

While inmate labor helps keep the roadsides clean, it does not change people's habits or prevent new litter from being deposited along roadsides. Once inmates have completed picking up litter from a 40 mile stretch of highway, it is necessary to start cleaning up that stretch again.<sup>33</sup>

## Keep America Beautiful

Keep America Beautiful, Inc. (KAB) is a non-profit organization that educates individuals about litter prevention and ways to reduce, reuse, recycle and properly manage waste materials. By partnering with citizens, businesses and government, KAB is able to clean up, beautify and improve neighborhoods and the environment.

Many people recognize KAB's public service announcements. The most famous announcement was the native American Indian, Iron Eyes Cody, standing on the side of the road with a tear in his eye. In 1998, due to increasing litter rates, KAB brought back a new public service announcement with Iron Eyes Cody entitled "Back by Popular Neglect."

Currently in Texas, KAB is seeking legislation that would require new drivers to be educated about litter prevention in driver education and driving safety courses. In addition to KAB, Texas uses Adopt a Highway programs and an aggressive "Don't Mess with Texas" advertisement campaign; as a result, Texas has seen a 72% reduction in roadside litter. Texas found that the most frequent litterers are white males, ages 18 to 34. Softer messages like "Pitch In" were not found to be effective with this group, and the "Don't Mess with Texas" public service announcements are designed to send a more forceful message. The Task Force viewed some of these public service announcements, as well as announcements from Utah and Philadelphia.

Within the state of Kentucky, KAB has five county and city affiliates. Kentucky has very few members because it is expensive to join KAB, and it involves annual dues. The coordinator of the KAB program in Kentucky is located in the Natural Resources and Environmental Protection Cabinet. This individual is hindered by the inability of that agency, as a *regulatory* agency, to seek corporate sponsorship for KAB activities.<sup>34</sup> Kentucky's Department of Transportation has developed public service announcements, but lacks the funds to purchase air time. Ethics laws do not allow solicitation of corporate sponsorship from state agencies.

Another perspective of KAB is that the program does not offer anything that Kentucky does not already offer in comprehensive solid waste management. Other states participate in KAB because those states do not have comprehensive solid waste management.<sup>35</sup>

Task Force members suggested that the ethics law be changed to allow agencies to seek private donations and corporate sponsorship for litter control programs. Also, it was suggested that beer wholesalers and the soft drink industry may have more leverage with radio and television stations in getting public service announcements aired since these industries already purchase air time.

## **Pollution Prevention**

KRS 224.46-315 established the Kentucky Pollution Prevention Center (the Center) to help small and medium-sized manufacturers identify and implement procedures that will reduce or eliminate pollution at the source. The Center works with businesses to help them save money and increase efficiency by identifying opportunities for waste reduction. Preventing pollution, rather than treating or cleaning it up, reduces raw material usage and energy losses, reduces the need for “end-of-pipe” treatment and disposal technologies, and reduces potential long-term liabilities associated with releases into the environment.

The Center reports that 50 to 66% of landfill waste comes from industry and commercial businesses. A good curbside recycling program only diverts 3 to 4% of waste from landfills, so the Center hopes that industry will become the backbone of waste diversion. An added bonus is that industry can generate the amounts of materials that may bring a major recycling processor to a community, which could attract curbside recycling.

The Center provides on-site industrial pollution prevention assessments, and these services are confidential, non-regulatory, and free. The Center also provides assistance through statewide training events, management seminars, and information services. Finally, the Center offers the Kentucky Industrial Materials Exchange (KIME) program where an industry can procure raw materials or find another industry that can use its process or scrap waste.

In 1994, the General Assembly established the Hazardous Waste Assessment Fund. Each industry generating solid hazardous waste or liquid hazardous waste pays a fee that goes into this fund. The Center receives 20% of this fund to be used for its technical assistance program. The fee runs out in 2000, and will need to be reauthorized in the 2000 Regular Session. Several Task Force members expressed their support for the Center and its activities, and recommended continued funding for the Center.<sup>36</sup>

## **Regional Recycling Centers**

The Task Force learned about the Bluegrass Regional Recycling Center (BRRRC), a nonprofit corporation that plans and designs complete regional infrastructures for collecting recyclables. Under this system, mini-processing “satellites” feed a larger, centrally-located material recovery facility that nationally markets recovered materials. With a regional approach, costs can be shared among local governments, and rural areas that otherwise would not have the volume to sustain a recycling program can recycle.

The BRRRC was created with one-time grants of \$50,000 provided to counties under KRS 224A.280 following its enactment in 1991. Of this grant money, \$40,000 went into each county’s home seed money while \$10,000 went to develop a regional project. Since then, 55 new jobs have been created with the BRRRC. The BRRRC provides regional affiliates with an analysis of solid waste programs, planning of future solid waste needs,

transportation of recovered material, and brokerage services. Collection strategies include curbside services, blue bag programs (where material is not sorted but placed in one large bag), drop off centers, and mobile trailer collection units.

In 1997 and 1998, the BRRC administered a federal grant to fund regional recycling programs and training programs. In 1999, federal grant money will be used to create community recycling information kits geared toward fourth grade students. Research has found that fourth graders are the most curious about recycling and will go home and promote the idea to their parents. Along these lines, one suggestion to the Task Force was for the state to develop a progressive recycling curriculum for teachers to use in grades K-8. Due to time constraints and lack of expertise regarding recycling, teachers prefer pre-designed curriculum units.<sup>37</sup>

### **Returnable Bottles**

The Task Force briefly discussed the possibility of requiring beverage manufacturers to offer their products in returnable bottles. The Greensburg Bottling Company in Green County offers Double Cola, Diet Double Cola, and Ski in returnable bottles with a 20 cent deposit redeemable at retail establishments.

Greensburg Bottling Company reported that in 1998, it lost approximately 50,000 bottles because consumers did not redeem them. This company found that a deposit does not bring the bottles back. Returnable bottles require washers, which most manufacturers have eliminated from their plants. Further, liability issues surround returnable bottles, making returnables risky for manufacturers.

## CHAPTER V

# LITTER SURVEYS

The Task Force received several surveys regarding litter in Kentucky. In an informal survey conducted by the Natural Resources and Environmental Protection Cabinet, 75 out of 77 counties responding indicated that litter was a problem. These 75 counties reported spending between \$300 and \$1,000,000 annually cleaning up litter. All survey respondents indicated that litter is found along rural roads, and 71 respondents indicated that state highways attract litter. The majority of respondents indicated that fast food containers were a problem in their area. Other types of litter listed as a problem by a majority of the respondents included plastic drink bottles, paper, aluminum cans, glass drink bottles, and cigarette butts.

Butler County inmates that serve on roadside crews estimate that beverage containers make up around 30% of the litter on roadsides. They find the majority of litter is fast-food trash.<sup>38</sup> Results of other, more formal surveys are presented below.

### **Kentucky Beverage Industry Recycling Program**

The Kentucky Beverage Industry Recycling Program (BIRP) presented a study that compared 1998 litter survey results with a 1980 survey to measure the progress achieved in litter reduction over the last 18 years.<sup>39</sup>

Comparing the litter rates from 1980 to those in 1998 found an overall reduction in litter of 61%. Highways and rural roads had a 45% reduction in litter over the 18 year span, while urban streets had a 75% reduction. When comparing Kentucky's 1998 litter rate with other states, the study found that Kentucky's litter rate is lower than rates in states without litter programs. However, the rate is higher than rates found in states with up to five years of litter reduction efforts. The study reported that Kentucky has the potential to decrease litter another 30% to reach the litter reduction levels of states with more than five years of litter reduction programs.

When Kentucky's litter rate is compared with the national average, the rate on urban freeways is 17% lower than the U.S. average, while the rate on rural highways is 40% higher than the U.S. average litter rate. On residential streets, Kentucky had rates that were 33% less than the U.S. average. However, litter rates in urban recreational areas were more than twice the U.S. average rate.

Regarding litter composition in Kentucky, the study found that the greatest portion of litter (12.7%), is candy, gum, and snack related packaging. This is followed by vehicle supplies, parts, and debris (12.1%), and cups, lids, and straws (11.5%). Beverage containers made up 8.6% of the total litter while fast food packaging (excluding napkins,

bags, utensils, cups lids, and straws) made up 4.2% of the total litter. The study found that between 1980 and 1998, litter rates decreased in 18 of 22 litter categories, with the largest decrease occurring in beverage container litter, which dropped 82%.

The study also examined deliberate and accidental litter, and distinguished between the two categories by the type of litter that was most likely to be deliberate or accidental. Fast food litter, bottles, and cans were considered deliberate litter, while vehicle supplies, parts, and debris were considered accidental litter. The study found that deliberate litter made up 56% of total litter, compared to 44% of accidental litter. These proportions of deliberate and accidental litter are similar to proportions found in other states. In urban areas, litter was predominantly deliberate, while on highways and rural roads, litter was more evenly distributed between deliberate and accidental categories.

The study attributes the decrease in litter from 1980 to 1998 to governmental and non-governmental litter reduction programs. These programs include stronger litter laws, volunteer and paid roadside cleanups, educational programs, city-regional litter reduction programs, advertisements, and increased recycling opportunities. To achieve greater litter reductions, the study recommended support for a paid advertising program targeted toward people responsible for the remaining litter problem in Kentucky.

### **Solid Waste Coordinators of Kentucky (SWaCK)**

SWaCK is an organization comprised of Solid Waste Coordinators who are employed by county governments in Kentucky. Among other things, these individuals implement county solid waste management plans. In 1999, solid waste coordinators were asked to perform a litter survey in their respective counties. Surveys were modeled after the BIRP survey discussed above, but without the 1980 baseline for litter rates. Survey results were received from 18 counties, distributed across Kentucky and representing both urban and rural areas.<sup>40</sup>

For this survey, litter was counted at 3 sites in each county: rural highways and roads, urban street frontages, and waterways if applicable. Like the BIRP survey, the SWaCK survey distinguished between accidental and deliberate litter. Litter was grouped into seven categories, including beverage containers and fast food litter.

SWaCK found that beverage containers accounted for 48% of all litter, while fast food litter made up 19% of the total litter. Along highways and rural roads, these percentages changed only slightly with beverage containers accounting for 54% of the total litter, and fast food making up 20% of the litter.

Along urban street frontages, beverage containers made up 43% of the litter while fast food litter made up 19% of the litter. Similar results were found along waterways with beverage containers accounting for 42% of the litter and fast food making up 16% of the litter.

SWaCK emphasized that litter continues to be a problem for solid waste coordinators, despite extensive educational efforts and successful recycling programs. SWaCK found that rural as well as urban counties face litter whether they are poor or affluent counties.

SWaCK recommended funding be made available for counties to adequately address the litter problem. This recommendation mirrored a previous recommendation by a Task Force member to provide funding to counties or regions for recycling capital costs and for the development of a recycling infrastructure.<sup>41</sup>

## **Kentucky Transportation Cabinet**

At the request of the Task Force, the Transportation Cabinet completed a survey of the types of litter found on roadsides in Kentucky. The survey examined state roads to find the percentage of litter by weight and volume that were beverage containers, and the percentage of total pieces of litter that were beverage containers or fast food litter. The survey was conducted by road crews in 12 highway districts, split equally between rural and urban districts, along a ½ mile road section in each district.

The survey found that overall, beverage containers made up 39.6 % of litter by weight and 30.8% of litter by volume. Of the total pieces of litter 31.7% were beverage containers while 23.5% were fast food cups or containers.

The survey found that litter rates were higher in rural areas than in urban areas, with the exception of an urban route in Bell County where beverage containers were 41% of the total litter pieces along that road. Also, litter rates along a rural route in Floyd County were lower than other rural routes, with beverage containers making up 19.1% of the litter. Typically, litter rates for beverage containers were higher in rural areas, while litter rates for fast food litter were higher in urban areas.

The Transportation Cabinet recommended coordination of litter control efforts among various state agencies, and funding for the Adopt a Highway program, similar to West Virginia's litter control efforts.

## **University of Kentucky**

The Survey Research Center (the Center) at the University of Kentucky conducts a phone survey biannually on a wide array of political, economic, and social issues. The survey routinely asks questions regarding demographics and performance of leaders. The Legislative Research Commission submits questions regarding legislative issues as needed, and for this survey included questions about public support for litter control policies.

For the Fall 1998 survey, the Center completed 628 phone interviews for a 28% response rate. Results of the survey are as follows:



- 89.9% of people polled agreed or somewhat agreed that litter in Kentucky is an important problem;
- 95.3% of people polled supported or somewhat supported a policy for programs in schools that focused on recycling;
- 75.9% supported or somewhat supported a policy of 5 cent deposit on beverage containers;
- 92.9% supported or somewhat supported a policy for curbside recycling programs;
- 91.5% supported or somewhat supported stricter penalties for littering;
- 75% supported or somewhat supported a .0025 cent fee on fast food cups and containers to go into a fund for county recycling and litter control programs; and
- 74.6% supported or somewhat supported a 50 cent fee per ton of garbage disposed at landfills to go into a fund for county recycling and litter control programs.<sup>42</sup>

The Survey Research Center reported that in each of these cases, over 41% of people polled were in the strongly support category, so not only is the public agreeing with these policies or programs, they are very much in favor of them.

The Center found that only 3.2% of those polled believed that environmental concerns were the first or second most important problem. Rather, the top three issues of concern to Kentuckians were jobs, education, and tobacco.

Because the survey over-represents people with higher education, the Center recalculated the results, weighting the results for the education variable. People with higher education were given less weight while people with lower education were given more weight. The new results found virtually no change in responses. Thus the Center determined no relation exists between people's opinions regarding these questions and their education level or income level.



## CHAPTER VI

# OTHER FINDINGS

### Markets for Recyclables

One of the concerns of the Task Force is whether markets would exist for beverage containers recycled under container deposit legislation. One reason for the concern is the extremely volatile market for recyclables. Global economic forces, such as oil prices, the downturn in the Asian economy, worldwide fiber markets, and the “dumping” of aluminum by Russia have led to large price swings. These fluctuations greatly affect municipal budgets, and can force recycling facilities out of business.

The Natural Resources and Environmental Protection Cabinet (the Cabinet) is taking steps to ensure that markets exist for recycled material. The Cabinet operates the Kentucky Recycling and Marketing Assistance Group to promote the development of infrastructure to support recycling. The Cabinet’s Buy Recycled Alliance program promotes market stability by encouraging companies to make and purchase products with recycled content. Currently, over 179 organizations have pledged to increase the amount of material used or produced containing recycled content.

Recycling is the return of material to the productive economic mainstream in the form of a raw material that is then manufactured into another product. “Market” means different things to different people. The individual consumer’s market is a place to deposit empty containers, such as a collection system. The collection system’s market is the processor or broker that flakes, pelletizes, or in other ways prepares recycled material. The processor’s market is the manufacturer, the manufacturer’s market is the retailer, and the retailer’s market is the consumer. Thus the recycling loop is completed.

Processors collect material in quantities of tractor trailer loads. Processing removes contaminants, and materials are crushed, baled, prepared, and packaged for shipment to the next level. Currently, 30 counties in Kentucky have processing capabilities, and most of these are near populated centers to ensure a consistent and reliable amount of material. Processors have contracts with manufacturers to supply a consistent amount of material. Material must be high quality and uncontaminated to maintain marketability.

Successful material recovery programs require a constant source of quality material. Economic incentives, such as a “pay as you throw” collection system, can improve the availability of material.

Convenience, a non-economic incentive, can also improve availability of material. Studies have shown that people living more than 5 miles away from drop-off centers will not use them. Today, the percentage of Kentucky citizens with a convenient access to recycling is around 50%.

Unfortunately, the cost of collection and delivery of material to a processor usually exceeds the value of the material. However, markets for tractor trailer loads of processed materials are available for all materials, and there is excess processing capacity for additional quantities of material at Kentucky's processing facilities.<sup>43</sup>

The Kentucky Recycling and Marketing Assistance Group identifies markets in Kentucky and publishes a directory of where people can take recyclables. This program provides technical assistance to communities and individuals who want to establish collection programs, equipment needs, and technical support. Also, the program publishes a monthly newsletter of prices currently paid for each commodity, and lists marketing opportunities for tractor trailer loads of recycled materials.

### **Trends in Packaging Materials**

The Task Force learned that plastic is becoming the material of choice for beverage containers. Of note is the recent move by a brewing company to bottle beer in polyethylene terephthalate (PET) plastic containers. For manufacturers, using recycled plastic does not compare economically or competitively with making virgin plastic. The price of oil, and thus virgin resin for plastics, is extremely low now. As of 1998, every major oil company had gotten out of recycling, focusing instead on producing virgin resin.<sup>44</sup>

The use of plastics is growing because of performance and consumer preference. Plastics require less material and less packaging to produce a container. As a result of source reduction and plastics innovation, containers continue to get lighter. Consumers prefer plastic because plastic containers can be resealed, keeping products fresher longer. Plastic containers are more transportable, and are a better insulator for beverages. Plastic containers keep the drinking spout sanitary, and products in plastic containers are perceived to taste better.<sup>45</sup>

Plastic containers can be recycled. In 1997, 40% of all plastic soft drink bottles and 31% of milk jugs were recycled, for an overall recycling rate of just under 25%.<sup>46</sup> Plastics are usually recycled into products with long lives, such as carpet, lumber, and playground equipment. Less energy is required to convert plastic material to fiber, and the product has a longer life expectancy than being converted back into a beverage container. Technology exists to accept all types of plastic and to sort all bottles. The recent decline in the national PET recycling rate is attributable to more products being introduced to the marketplace and the increased use of single serve containers.<sup>47</sup>

In other news, the Task Force learned that recyclable and biodegradable starch-based clamshell packaging including cups, plates, bowls, and hinged-lid containers is being made for the fast food industry. Starch is a renewable agricultural product and the use of starch to make plastic will reduce the world's dependence on oil, a non-renewable resource.<sup>48</sup> Other companies are researching new "generations" of starch-based

biodegradable plastics for uses as shotgun shell cases, plastic cutlery, dog bones, and other food serviceware.

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## FOOTNOTES

- <sup>1</sup> Discussion from Container Deposit Task Force Meeting, Frankfort, KY, October 7, 1998.
- <sup>2</sup> Discussion from Container Deposit Task Force Meeting, Frankfort, KY, October 7, 1998.
- <sup>3</sup> Food Marketing Institute, *Supermarket Facts, 1997 Industry Overview* (Washington, DC: FMI, 1997), p.1.
- <sup>4</sup> Testimony received from Mike Bowling, Frankfort, KY, September 1, 1999.
- <sup>5</sup> Memorandum from Ginny Wilson, Frankfort, KY, 2 June 1999.
- <sup>6</sup> Letter from Mark Berger and William Sturgill, Lexington, KY, August 27, 1999.
- <sup>7</sup> Testimony received from Mike Brown, Frankfort, KY, January 13, 1999.
- <sup>8</sup> Testimony received from John Webster, Frankfort, KY, December 2, 1998.
- <sup>9</sup> Discussion from Container Deposit Task Force Meeting, Frankfort, KY, June 2, 1999.
- <sup>10</sup> Container Recycling Institute, *Beverage Container Deposit Systems in the United States II* (Washington, DC: Container Recycling Institute, 1997) p.13.
- <sup>11</sup> Discussion from Container Deposit Task Force Meeting, Frankfort, KY, December 2, 1998, and testimony received from Doug Petersen, Frankfort, KY, May 21, 1999.
- <sup>12</sup> Testimony received from John Webster, Frankfort, KY, December 2, 1998.
- <sup>13</sup> Testimony received from Mike Brown, Frankfort, KY, January 13, 1999.
- <sup>14</sup> Discussion from Container Deposit Task Force Meeting, Frankfort, KY, September 2, 1998.
- <sup>15</sup> Testimony received from Joe Massey, Frankfort, KY, November 4, 1998 and testimony received from Terry Branstad, Frankfort, KY, June 2, 1999 and testimony received from Doug Petersen, Frankfort, KY, May 21, 1999.
- <sup>16</sup> Testimony received from Joe Massey, Frankfort, KY, November 4, 1998.
- <sup>17</sup> Testimony received from Terry Branstad, Frankfort, KY, June 2, 1999.
- <sup>18</sup> Testimony received from Joe Massey, Frankfort, KY, November 4, 1998.
- <sup>19</sup> Testimony received from Terry Branstad, Frankfort, KY, June 2, 1999.
- <sup>20</sup> Testimony received from Terry Branstad, Frankfort, KY, June 2, 1999.

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- <sup>21</sup> Testimony received from Terry Branstad, Frankfort, KY, June 2, 1999.
- <sup>22</sup> Robert E. Kramer and Gene M. Lutz, *Attitudes and Opinions on Iowa's Beverage Container Recycling Law* (Cedar Falls, Iowa, 1998), p. 7.
- <sup>23</sup> Karen Schwaller, "Benefits From Bottle Deposit Law Pile Up," *Iowa Commerce*, June 1998, p. 10.
- <sup>24</sup> Discussion from Container Deposit Task Force Meeting, Frankfort, KY, June 2, 1999.
- <sup>25</sup> Testimony received from Doug Petersen, Frankfort, KY, May 21, 1999.
- <sup>26</sup> Testimony received from Doug Petersen, Frankfort, KY, May 21, 1999.
- <sup>27</sup> Testimony received from Doug Petersen, Frankfort, KY, May 21, 1999, and discussion from Container Deposit Task Force Meeting, Lexington, KY, August 11, 1999.
- <sup>28</sup> Testimony received from Doug Petersen, Frankfort, KY, May 21, 1999.
- <sup>29</sup> Testimony received from Ernest Nash, Lexington, KY, August 11, 1999.
- <sup>30</sup> Testimony received from Ernest Nash, Lexington, KY, August 11, 1999.
- <sup>31</sup> Testimony received from Mike Bowling, Frankfort, KY, September 1, 1999.
- <sup>32</sup> Discussion from Container Deposit Task Force Meeting, Frankfort, KY, February 3, 1999.
- <sup>33</sup> Discussion from Container Deposit Task Force Meeting, Lexington, KY, August 11, 1999.
- <sup>34</sup> Discussion from Container Deposit Task Force Meeting, Frankfort, KY, October 7, 1998.
- <sup>35</sup> Discussion from Container Deposit Task Force Meeting, Frankfort, KY, October 7, 1998.
- <sup>36</sup> Discussion from Container Deposit Task Force Meeting, Frankfort, KY, March 3, 1999.
- <sup>37</sup> Testimony received from Mickey Mills, Frankfort, KY, January 13, 1999.
- <sup>38</sup> Testimony received from Terry Fugate, Butler County Jailer, Lexington, KY, August 11, 1999.
- <sup>39</sup> Donna R. Waterman, "Litter in Kentucky: 1998 Analysis," February 19, 1999.
- <sup>40</sup> Solid Waste Coordinators of Kentucky, "Litter In Kentucky, A View from the Field," May 21, 1999.
- <sup>41</sup> Discussion from Container Deposit Task Force Meeting, Frankfort, KY, October 7, 1998.
- <sup>42</sup> Testimony received from Dr. Ron Langley, University of Kentucky, Survey Research Center, Frankfort, KY, May 21, 1999.
- <sup>43</sup> Testimony received from Charlie Peters, Frankfort, KY, March 3, 1999.
- <sup>44</sup> Dee J. Hall, "Recycling: Some Hard Questions," *Wisconsin State Journal*, January 24, 1999.
- <sup>45</sup> Testimony received from Rudy Underwood, Frankfort, KY, March 3, 1999.

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<sup>46</sup> Testimony received from Rudy Underwood, Frankfort, KY, March 3, 1999.

<sup>47</sup> Testimony received from Rudy Underwood, Frankfort, KY, March 3, 1999.

<sup>48</sup> Business Wire, "EarthShell Comments On Production and Partnership Activities," January 29, 1999, p. 1.