Champaign County Solid Waste Management Plan

PART II
SOURCE REDUCTION

Prepared by the
Intergovernmental Solid Waste Disposal Association
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Introduction

In 1986, the Illinois Solid Waste Management Act (PA 84-1319) was signed into law. The Solid Waste Management Act established a hierarchy for solid waste management for local governments in the State. That hierarchy, and its objectives, were stated as follows:

> It is the purpose of this Act to reduce reliance on land disposal of solid waste, to encourage and promote alternative means of managing solid waste, and to assist local governments with solid waste planning and management. In furtherance of those aims, while recognizing that landfills will continue to be necessary, this Act establishes the following waste management hierarchy, in descending order of preference, as State policy:
>
> (1) volume reduction at the source;
> (2) recycling and reuse;
> (3) combustion with energy recovery;
> (4) combustion for volume reduction;
> (5) disposal in landfill facilities.

In order to assist local governments in the complex task of implementing this management hierarchy, the State of Illinois established a solid waste planning grant program. The Intergovernmental Solid Waste Disposal Association (ISWDA), was one of the first entities in the state to receive a grant under this program.

The Solid Waste Planning and Recycling Act (PA 85-1198) became effective January 1, 1989. The intention of the Act was to further clarify the directives for local solid waste planning and management. The Solid Waste Planning and Recycling Act requires the following information be established in local plans:

(1) A description of the origin, content and weight or volume of municipal waste currently generated within the County's boundaries, and the origin, content, and weight or volume of municipal waste that will be generated within the County's boundaries during the next 20 years, including an assessment of the primary variables affecting this estimate and the extent to which they can reasonably be expected to occur.

(2) A description of the facilities where municipal waste is currently being processed or disposed of and the remaining available permitted capacity of such facilities.

(3) A description of the facilities and program that are proposed for the management of municipal waste generated within the County's boundaries during the next 20 years, including, but not limited to their size, expected cost and financing method.

(4) An evaluation of environmental, energy, life-cycle cost and economic advantages and disadvantages of the proposed waste management facilities and programs.

(5) A description of the time schedule for the development and operation of each proposed facility or program.

(6) The identity of potential sites within the County where each proposed waste processing, disposal and recycling facility will be located or an explanation of how the sites will be chosen. For any facility outside the County that the County proposes to utilize, the plan shall explain the reasons for selecting such facility.

(7) The identity of the governmental entity that will be responsible for implementing the plan on behalf of the County and explanation of the legal basis for the entity's authority to do so.

The purpose of this part of the Champaign County Solid Waste Management Plan is to review options and techniques to accomplish volume reduction at the source, or source reduction. After a review of options, a series of recommendations are presented.

As previously shown, the Illinois Solid Waste Management Act (PA 84-1319) cites source reduction as the primary waste management technique. Illinois is not alone in placing source reduction at the top of their hierarchy. Many other states, including Minnesota, New York and Connecticut, also place source reduction as the primary solid waste management technique. Although it is listed as the primary tool, it is the least used and implemented tool. The Community Environmental Council, the publisher of The Next Frontier: Solid Waste Source Reduction, points to three factors that have kept source reduction from being widely accepted and practiced including an ambiguous

understanding of the definition and potential of source reduction, unfavorable disposal economics (i.e. cheap landfill costs) and the hazardous waste problem.

Although the State has designated source reduction as the primary solid waste management tool, there is no accompanying definition. The State has not defined source reduction in any legislation adopted through the 1989 legislative session. The State hierarchy, as stated in the Illinois Solid Waste Management Act, was adopted in 1986. There has also been little guidance from the State in terms of source reduction goals or programs. Illinois also has "cheap landfill costs." According to a survey conducted by BioCycle (March 1990), Illinois' tipping fees range from $8 to $29 per ton. The $8.00 per ton figure is comparable to the lowest costs in other states, while $29.00 per ton becomes slightly higher than the average tipping fee in the United States. Using the national average of $18.50 per ton, there are 22 states with lower average tipping fees and 19 with higher average tipping fees. (Figures for 9 states were unavailable). The lowest per ton costs in the survey were $3.00 per ton in California and South Dakota while the highest figure was $120.00 per ton reported in New York.

The ideal solution to waste disposal is to not waste anything. It is generally agreed that some waste will be produced in the course of human activity but that changes in practice and lifestyles could reduce the waste quantity discarded. The impact on the individual is that each person would have to conserve materials by changing purchase and use habits. The trend has been toward increasing the amount of waste discarded per person. Since the population is also increasing, the total solid waste growth is greater than either the population growth or the increase in waste generation per person.

Individuals are not the only contributors to solid waste. Construction and industry also produce waste. Construction/demolition waste is generally produced proportional to the population because new construction is necessary to accommodate the growing population. Likewise, industrial waste is generally produced proportional to the population

since an increased employment base is necessary to supply income and goods for the population.

Zero Growth Option

Part One of the Champaign County Solid Waste Management Plan, "Solid Waste Characteristics" outlines the historic and projected wastestream in Champaign County. Total waste generation was estimated at 6.25 pounds per person per day. Of this, about 1.84 pounds per person per day was construction/demolition waste and 0.41 pounds per person per day was industrial waste, 3.39 pounds per person per day was municipal solid waste and the remainder, 0.61 pounds per person per day, was treatment sludge. Table 1 shows how total solid waste generation is likely to increase through 2010.

TABLE 1

Champaign County Waste Projections:
In Pounds Per Capita Day, 1988-2010

	1988	1990	1995	2000	2005	2010
Population	173,177	173,870	175,616	177,379	179,160	180,959
Residential/Commercial	3.39	3.43	3.53	3.64	3.75	3.87
Construction/Demolition						
Processible	0.94	0.94	0.94	0.94	0.94	0.94
Non-processible	0.90	0.90	0.90	0.90	0.90	0.90
Industrial	0.41	0.41	0.41	0.41	0.41	0.41
Treatment Sludge	0.61	0.61	0.61	0.61	0.61	0.61
Total Pounds Per Capita Day	**6.25**	**6.29**	**6.39**	**6.50**	**6.61**	**6.73**
Total Pounds of Waste Per Family of 4 Per Year	9,125	9,183	9,329	9,490	9,651	9,826
Total Tons of Waste Per Family of 4 Per Year	4.56	4.59	4.66	4.74	4.83	4.91
Total Tons Per Year	197,530	199,590	204,799	210,416	216,125	222,258

It has been suggested that the pattern of consumption and disposal can be restricted, even reversed, by conscious choice. Since reduction of population growth would be unreasonable to assume, freezing increases in solid waste generation by individuals would be the alternative. Table 2 shows how total solid waste would increase if growth in generation were frozen at 1988 levels. This is done by keeping the pounds per person per day constant at 3.39, the 1988 level. The construction/demolition, industrial and treatment sludge tonnage also remain unchanged per person per day. However, the population continues to grow and this results in an increase of the total solid waste from 197,530 tons per year in 1988 to 206,406 tons per year in 2010. In 1990, the average family of four would have to conserve 58 pounds per year to achieve this "reduction". (See Appendix One for calculations). By the year 2010, the average family of 4 would have to reduce their generation by approximately 701 pounds per year.

TABLE 2

Effect of Freezing Waste Growth at 1988 Levels:
For Champaign County, In Pounds Per Capita Day, 1988-2010

	1988	1990	1995	2000	2005	2010
Population	173,177	173,870	175,616	177,379	179,160	180,959
Residential/Commercial	3.39	3.39	3.39	3.39	3.39	3.39
Construction/Demolition	1.84	1.84	1.84	1.84	1.84	1.84
Industrial	0.41	0.41	0.41	0.41	0.41	0.41
Treatment Sludge	0.61	0.61	0.61	0.61	0.61	0.61
Total Pounds Per Capita Per Day	**6.25**	**6.25**	**6.25**	**6.25**	**6.25**	**6.25**
Total Pounds of Waste Per Family of 4 Per Year	9,125	9,125	9,125	9,125	9,125	9,125
Total Tons Per Capita Year	197,530	198,320	200,312	202,323	204,354	206,406

The composition of solid waste in the United States in 1990 was estimated by Franklin Associates, Inc. These estimates are shown in Table 3. Also shown in Table 3 are the projected pounds per year of each component that a family of four would discard. In 1990, the goal of freezing the growth of solid waste could be achieved if each person in

TABLE 3

Waste Composition:
For a Family of Four in the United States

	Composition Distribution[1]	1990 Pounds Per Year	2010 Pounds Per Year
Paper and Paper Based	39.6%	1943	2226
Glass	8.1%	397	455
Ferrous	8.5%	417	478
Non-Ferrous Metals	0.8%	39	45
Plastics	8.2%	402	461
Rubber & Leather	2.4%	118	135
Textiles	2.2%	108	124
Wood	3.6%	177	202
Food	7.6%	373	427
Yard	17.0%	834	956
Other	2.0%	98	112
TOTAL		**4,906**	**5,621**

Source: Adapted from Franklin Associates, Inc. Characterization of Municipal Solid Waste in the United States 1980-2000.

(1) This Distribution between materials was held constant when estimating the 2010 generation rates. No attempt was made to estimate the increase or decrease of different materials, such as plastic, in the wastestream.Champaign County used 2.1%,

Champaign County used 2.1%, by weight, less of each of paper, glass and plastic. However, in 2010 this goal could only be achieved by using 22% less of each of paper, glass and plastic. The "zero growth" goal would not be achieved if the family reduced their paper use and then substituted glass or plastics as another discarded commodity.

The growth of total solid waste can not be arrested by simply freezing the growth of individual generation. To reduce or freeze the growth of total solid waste requires that

individual generation must decline at a rate that compensates for population growth and the growth of industrial, construction/demolition and treatment waste. Table 4 shows the effect of freezing total solid waste at 1988 levels. The individual rate of generation declines as the population increases in order to maintain the 1988 levels of total solid waste generated.

TABLE 4

Effect of Freezing Total Waste at 1988 Levels:
For Champaign County, In Pounds Per Person Per Day, 1988-2010

	1988	1990	1995	2000	2005	2010
Population	173,177	173,870	175,616	177,379	179,160	180,959
Residential/Commercial	3.39	3.36	3.30	3.24	3.18	3.12
Construction/Demolition	1.84	1.84	1.84	1.84	1.84	1.84
Industrial	0.41	0.41	0.41	0.41	0.41	0.41
Treatment Sludge	0.61	0.61	0.61	0.61	0.61	0.61
Total Pounds Per Capita Day	**6.25**	**6.23**	**6.16**	**6.10**	**6.04**	**5.98**
Total Pounds of Waste Per Family of 4 Per Year	9,125	9,081	8,994	8,906	8,818	8,731
Total Tons Per Capita Year	197,530	197,530	197,530	197,530	197,530	197,530

To achieve the goal of maintaining the 1988 level of **total** solid waste in 1990, the average four person family would have to conserve about 100 pounds per year; they would have to use approximately 4% by weight, **less** of each of paper, glass and plastic. By 2010 the average four person family will have to conserve approximately 1095 pounds per year or use approximately 35% less of each of paper, glass and plastic while maintaining 1988 generation levels in other categories. This was based on the assumption that every person in the County would participate in reducing his or her generation of solid waste.

To stop using all paper, glass and plastic, without substituting other products, means that letters, magazines, newspapers, food wrappers of all kinds, paper plates and napkins, disposable diapers, cardboard boxes as well as many other items would not be used. If this were possible, it would be sufficient to meet the required reduction of 1095 pounds per year. However, if over half of the population did not participate in the reduction efforts, it would be impossible for the remaining participants to compensate for the non-participants. The goal of freezing the total solid waste at 1988 levels could not be achieved.

Although source reduction is the preferred waste management technique, programs to educate and encourage the type of reduction just discussed have been infrequent. Information programs for the residents of Champaign County about the increase in solid waste generation and the level of reduction needed to halt or reverse the current trend are part of this integrated waste management plan.

Current Source Reduction Programs

There are no municipally sponsored source reduction programs currently operating in Champaign County. The education programs developed by the Community Recycling Center (CRC), which are partially funded from municipal contracts, do include a source reduction component. The only source reduction program currently operating in Champaign County is the Model Community Program. The Model Community Program was developed and is operated by Central States Education Center (CSEC). To become part of the program, industry, businesses and institutions adopt appropriate source reduction and recycling activities. The activities vary depending on the nature of the business or institution. The first business to become part of the program was a local grocery store. The store's activities consist of labeling about 1,500 products throughout the store to inform consumers if the package or product is recyclable, is an example of minimal packaging, or is a "safe earth" product (a less toxic alternative). As part of the program, CSEC will be tracking the sale of the tagged products against similar, un-

marked products. This will assist in determining if this type of labeling affects consumer purchasing. The preliminary results should be available in Fall 1990. CSEC also has a school, garbage hauler, copier shop and a church in the program. The Recycling Coordinator for the Village of Rantoul has also been labeling products in the local grocery store. This effort is similar to CSEC's program, but not as elaborate.

Any other source reduction programs in the County were developed by local businesses or industries in-house and have not been publicized. Many local manufacturers may have source reduction programs in place and may not be aware of it. Returning scrap material to the processing line when possible is activity that a manufacturer may implement for economic reasons, unaware that it can be classified as a source reduction activity. The extent of source reduction programs in Champaign County was difficult to determine, but was assumed to be small-scale and infrequent.

Source reduction activities are usually divided into residential, or post-consumer, and commercial/industrial. This is due to the difference in the methods and the impacts source reduction programs would have at homes verses businesses. In an integrated waste management program, source reduction programs should be designed for each sector.

Post-Consumer vs. Industrial Waste Reduction

When the subject of source reduction is addressed, it is usually divided into post-consumer, or residential, and industrial (including construction/demolition). How customers can reduce the waste they generate, and the impact that reduction will have on the wastestream, is different from how a manufacturer would reduce waste.

Regulation of industrial source reduction requires a more specific knowledge than is necessary to regulate residential source reduction. Knowledge of various industrial

processes and life-cycle costs are needed to determine where source reduction can occur. Specific knowledge about the various products would also be necessary.

Amending existing regulations and ordinances to incorporate source reduction ideas or programs should be the first step. Business permits, operator's licenses and building codes are examples of existing regulations that could be amended. Once these options have been explored and implemented, the impact of such programs on source reduction could be reviewed. After that assessment, new regulations could be developed if necessary. By amending existing regulations and ordinances first, unnecessary regulations can be avoided.

A residential setting is different from an industrial setting. Homeowners have fewer regulations to comply with. An example of this difference can be found with the use and disposal of hazardous materials. Many hazardous materials are strictly regulated in the workplace including handling and disposal. However, if the same material is included in a product intended for household use, a warning on the product label is often all that is required. Due to the differences in the types of regulations affecting the industrial sector and the residential sector, different source reduction programs should be developed for each area.

This portion of the Champaign County Solid Waste Plan recognizes the need to encourage source reduction. There are a number of source reduction management techniques recommended in this plan. The techniques are aimed at:

(1) Generation of less waste.
(2) Toxicity reduction in the waste generated.
(3) Alteration of the wastestream to make it more processible downstream.

Source reduction definitions usually include the concept of an overall decrease in waste generation. There is often an implied goal of the cessation of waste generation. Since

it appears the definition of source reduction is still somewhat tenuous, in this plan, two supplementary source reduction goals have been established. These are toxicity reduction and alteration of the wastestream.

These two goals are intended to help focus efforts on specific areas of source reduction. Reduction of toxics in the wastestream can help reduce the threat of environmental hazards, such as groundwater contamination. Safety hazards caused by toxics at businesses and homes could also be reduced by encouraging people to reduce their use of toxic materials or find alternative materials to use. Alteration of the wastestream to make it more processible "downstream" is intended to tailor the wastestream to the current waste processing, including recycling, system. For example, if plastic soda bottles (PET plastic) were recycled in a particular county, then it may be more productive to focus source reduction efforts on packaging or some other problem material. However, if PET plastic was not recycled in the county while aluminum was, then efforts could be focused on encouraging the use of aluminum and reducing the use of PET plastic. This type of effort would alter the wastestream to replace PET plastic with aluminum. Since the aluminum can be recycled while the PET would be landfilled, the wastestream has been altered to increase the amount that can be processed by the waste management system.

For implementation of the source reduction objectives, three basic policy alternatives have been explored:

(1) Regulation: This includes bans or restrictions of materials or the regulation of product design, manufacture or use;

(2) Financial Incentives: Surcharges or disposal deposits on material, such as car batteries or tires, fall into this category; and

(3) Education/Research: Programs to educate consumers about proper disposal or true disposal costs through posters or point of sale displays is an educational approach.

Regulation

Regulation of source reduction can cover the design, manufacturing or use of a product. The effectiveness of regulatory measures varies depending upon the level of government enacting the regulation. Most county or municipal governments would have a difficult time enacting and enforcing minimum warranty or material content regulations on all products entering their jurisdiction. These types of regulations should be enacted on a larger scale such as the state or, preferably, the national level. However, a municipal government can readily adopt purchasing regulations or begin requiring some type of mandatory total cost calculations from their own departments.

Material bans are an example of a regulatory option. Outright bans of certain materials are unusual. This is usually done when there is an acceptable substitute and the ban does not place an undue burden on the population or business community. One example is the City of Newark, New Jersey's ban of any chlorofluorocarbon (CFC) processed food packaging. One exception in the ordinance focuses on the inability to find substitutes. Businesses can be excepted from the law if they are unable to find a substitute product. The business requesting an exception must prove that they have attempted to locate alternatives by providing a list of vendors contacted. If undue hardship can be proven, then that business can continue to use CFC processed packaging. Frequently, bans are combined with regulations on product design. The State of Florida has banned plastic rings, usually found on 6-packs, and plastic shopping bags unless the material is designed to be degradable within 120 days.

Some of the other areas that can be addressed by regulatory measures include:

(1) Secondary Material Content: The use of recycled material as feedstock including a ban of certain virgin materials.

(2) Product Durability (Useful Life): The creation of minimum warranty regulations or "ease of repair" requirements aimed at durable goods.

(3) Product Reusability: Similar to product durability but focusing on non-durable goods such as shipping containers. Another example is beverage containers, requiring glass instead of aluminum.

(4) Product Recyclability: How easily can a product be recycled? Regulations could address items like ease of mechanical disassembly, standardizing parts, prohibit or restrict certain material combinations such as plastic coated metal, better identification of materials composition, restrict use of dangerous or contaminating materials.

(5) Reduction of Material Content Per Unit: Specification of maximum sizes of products or prohibitions of excessive packaging.

(6) Product "Potential-for-Disposal" Damages: Design or performance standards to diminish environmental impact of disposal.

(7) Product Degradability: Product design regulations aimed primarily at litter control.

(8) Certification of Disposal: Proof of proper disposal, focusing on motor vehicles, would be required before registering a new one.

(9) Mandatory Total Cost Calculation Disclosure: This would require disposal costs to be included in an item's sale price. Other costs could be included such as "social" costs, or environmental damage costs.

(10) Purchasing Regulations for Government Agencies: A method governments could use to endorse waste reduction by purchasing more durable goods, or requiring better product design in contracts.

As previously mentioned, regulatory options such as those described above, are not practical at all levels of government. Options 1 through 7 would be most effective when enacted at the national level or the state level. Several states have adopted or reviewed

regulations regarding secondary material content especially for newsprint. However, even at the state level, the problem of consistency arises. Each state has its own definition of "recycled content" and different content levels. This may make it more difficult, and more expensive, for manufacturers to produce products. If individual counties or municipalities began adopting their own regulations, the situation could become even more complex.

Regulatory options number 8 through 10 are more applicable at the county level. Certificate of Disposal programs could be developed for motor vehicles or white goods (appliances). Additional taxes, specifically for disposal of difficult to handle items, could be part of a mandatory total cost calculation disclosure program. This type of program would allow different counties to tax items that are difficult to dispose of in each particular county. Another version of a mandatory cost calculation program would be to require governmental agencies to figure the disposal costs of an item into the initial cost estimates made prior to purchasing. Purchasing regulations could also be altered at any government level or agency, such as school district, to require recycled content in a wide range of goods.

Financial Incentives

Financial incentives, or disincentives, in source reduction are a way to incorporate the cost of disposal into the retail price of an item or service. This allows the consumer to decide if they will pay more for a "hard-to-dispose" item than for a less expensive product that may be recyclable. Deposits and surcharges are the most obvious form of financial incentives. User charges and product disposal taxes are two additional forms of financial incentives. The funds raised through these options are usually used by the government body that enacted the fee to mitigate the disposal inequities associated with the product or service.

The State of Illinois has enacted two surcharges: one on landfill disposal and one on used tires. The landfill surcharge enacted in the Solid Waste Management Act

PA 84-1319 (1986), allows the State and local governments to impose additional landfill tipping fees for solid waste management purposes. A sliding scale based on volume determines the State rate landfills must pay, and local fees are set by the appropriate local government with a not-to-exceed level set by the State. An increase in the Certificate of Title will fund the tire surcharge program. Fifty cents ($0.50) per title will go toward clean-up of tire accumulations; encourage recycling and market development for tire products; and address public health concerns associated with tire accumulations. The State of Wisconsin also has a $2 per tire surcharge on new motor vehicles to fund clean up of waste tire piles and to fund tire recycling and reuse projects.

Surcharges

As mentioned above, deposits and surcharges are the most well known example of source reduction measures. Surcharges and deposits also serve as an incentive to recycling since a credit or refund is offered for the return of specific items. The thin line between source reduction and recycling is apparent in this option. If a deposit is required on a non-durable good, such as lead-acid batteries, then the deposit is a recycling measure. However, if the deposit is required on a durable item that can be reused in the same capacity, such as glass beverage bottles, then it can be viewed as a source reduction measure. This is because the glass bottles are being returned for use as beverage containers where no additional processing, other than sanitizing, is needed. The purpose of the deposit on batteries is to keep them out of the wastestream to reduce toxicity and encourage recycling. It could be argued that recycling the batteries is a form of source reduction because there is less processing required to manufacture a new battery, thereby generating less waste. In either case, it is important that an efficient and convenient system for returning items be developed as part of any surcharge program.

User Fees

User fees are frequently used by municipal governments for a variety of items ranging from water and sewer fees to green fees at city owned golf courses. User fees are developed as an attempt to charge people for a service according their level of use. A

green fee places the burden of supporting the golf course on those that use the facility, including non-residents. In terms of source reduction, user fees for garbage disposal have been developed. An example is charging residents a variable rate dependent on the amount of waste they throw out. This is usually based on the number of bags or cans of garbage set out. Again, the question of source reduction versus recycling arises. It is hard to determine if the resident is **generating** less trash, recycling or otherwise disposing of it.

Several communities, such as Seattle, Washington, have begun to charge residents for their garbage service according to level and frequency. Seattle uses a variable rate for one, two or three can service; offers a mini can option; and sells stickers for extra bags of garbage. In 1989, the monthly fees for a single can was $13.55 and increased to $31.55 for three can service. Stickers were priced at $5 each. Curbside recycling pick-up was offered at no charge. It was reported that the number of containers did decline after the variable rate went into effect. However, much of that was attributed to increasing the amount of garbage in the remaining containers. Seattle established a limit of 60 pounds per container to prevent abuse of the system. Haulers can refuse to handle containers that feel too heavy. The haulers also are provided with route books detailing the level of service each home has ordered. Seattle is anticipating a program in the future which will weigh customers' garbage and charge by the pound.

Other communities use variations of this idea. The Borough of High Bridge, New Jersey issues a set of 52 stickers to each residence. The stickers are supposed to last for one year. Unusual items, such as sofas, are required to have a pre-determined number of stickers on them before they will be picked up. If a resident runs out of stickers, they can purchase additional stickers at a fee that reflects the current landfill costs. Recyclable material does not require a sticker, and monthly curbside pick-up is provided.

There are several ways to offer variable user fees for garbage service. They include:

(1) Charging by number and size of containers used;
(2) Charging by frequency of pick up;
(3) Charge by metered bags or stickers; and
(4) Charge by weight.

However, a United States Environmental Protection Agency study in 1979 found that "demand for household solid waste service, in the most cases, seems to be highly inelastic with respect to price," (USEPA, 1979. Doc. #EPA-600/5-79-008). Seattle saw the use of a second can fall from 77% to 46%, but it appears the same quantity was simply forced into one container. Many argue that user fees of all types hurt those that can least afford it.

Product Disposal Taxes

A product disposal tax can be either a deposit or a surcharge. The difference is that the surcharge is not refundable. This is another financial incentive that incorporates the disposal costs into the retail price of an item. These taxes can be added at the factory or retail outlet. Since disposal costs vary, compromise figures would have to be determined that included some of the following considerations: volume of waste generated during manufacturing; difficulty of disposal (including toxicity); actual disposal charges; and other environmental impacts (such as CFC's).

This type of tax allows the consumer that uses the product to pay the disposal costs as opposed to society as a whole. The taxes can be assessed according to product, product class or material. This would also allow different levels of fees to be placed on items that are easier to recycle or contain recycled material. Higher fees could be developed on products that use virgin materials and those fees could reflect concerns such as scarcity or energy intensity of the material.

Educational and Research

As previously mentioned, the term source reduction does not have a fixed definition. Research could assist in creating that definition. Additional research could help assess the impact of source reduction programs and options. Development of criteria to help study the effectiveness of various source reduction options would be useful to local governments in selecting source reduction programs. Currently it is difficult to measure how much waste is **not** generated.

Education, such as point-of-sale (POS) displays, can assist consumers in making the "better" choice. Consumers may not realize which items are recyclable in their area. Education programs would be a first step in any type of source reduction program. An education program would have to be included in many of the regulatory options or financial incentive programs outlined. An example would be an education and advertising campaign for refund locations which were established due to a deposit bill. The State of Illinois has established a materials exchange service: Illinois Industrial Material Exchange Service (IMES). This service helps reduce waste by reusing it. The service aides in marketing materials that have become unusable, or waste, at one business but that may be used as feedstock at another business. The IMES is an information clearinghouse which lists material available and materials wanted by various companies. When there is a "match", IMES provides each company with a contact name and the negotiations and exchange of material is the participating companies' responsibility.

Other education programs, such as Berkeley, California's "Precycle", focus on residential consumers by informing them about the true disposal costs and environmental impacts of various products, like disposable diapers. Seattle has included a "Stop Buying Trash" shopping checklist in utility bills. The State of Rhode Island has developed OSCAR, Ocean State Cleanup and Recycling, an educational program for children in grades 4 through 8.

Recommendations For Source Reduction

The recommendations for source reduction are based on several assumptions: They include the following:

(1) Source reduction activities alone are insufficient to address the solid waste problems and to reach the goals established by State and local governments. Source reduction activities and programs must be part of an integrated solid waste management system.

(2) Education should be the primary method in developing source reduction activities and programs. Since source reduction is a virtually unused management tool in Champaign County, education is important. Education campaigns would be necessary in any source reduction program because Champaign County residents are probably unaware of the concept. Therefore, education programs should be the first step in source reduction.

(3) Source reduction programs will result in less solid waste being generated. Since it is difficult to quantify what has not been generated, attributing what portion of waste was not landfilled because of source reduction would be very difficult. **Therefore, no specific goals in terms of percentage of waste diverted from landfills through source reduction programs will be set.**

Post-Consumer Source Reduction

Using the three management techniques of education, regulation and financial incentives, the following are the recommendations for post-consumer source reduction:

Education

(1) **An education program should be part of the implementation plan.** This will ensure that an integrated waste management curriculum is developed and taught. The nature of the position(s) needed will be determined within 1 year of the plan's adoption.

The education program should be developed that includes a number of activities that promote source reduction, reduction of toxicity and recyclability. The program may include the following activities:

1) **Educational Programs:** Programs promoting source reduction should be developed. The program could consist of presentations with audio/visual aids. It would be appropriate to develop programs for different education levels. School districts would be offered the opportunity to book the program at no cost. Other citizen organizations, such as Rotary, Lion's Club, Garden Clubs, League of Women Voters and others, can also be targeted. The programs should focus on what individuals can do to reduce the waste they generate (See Table 5 for examples).

2) **Workshops and Conferences:** Workshops and conferences can be used to promote various source reduction activities, such as reduction of hazardous waste generation. Outside speakers could be invited to attend. Another topic that would be appropriate for a workshop is how to conduct a waste audit. Local businesses or even homeowners could attend and learn how to do their own waste audits to identify ways to reduce their waste generation.

3) **Clearinghouse:** The education coordinator should act as a clearinghouse for information on source reduction activities. This could include distribution of information such as the Hazardous Waste Wheel or other literature. A loan program may be developed for periodicals or reading material. And the coordinator can act as a "reference librarian" by assisting local residents and businesses in locating specific information on particular source reduction issues.

4) **Advertising/Promotion:** An advertising and promotion program should be developed. This could use television, radio, billboards, doorhangers, brochures, posters and displays. This activity could include advertising for recycling services and opportunities as well. Movable displays could be used in local malls, schools, stores, public buildings, office buildings and libraries. The possibility of obtaining permanent display space should be investigated. Special events such as the Sweet Corn Festival and the Taste of Champaign, could also be promotion opportunities.

5) **Local Recognition Awards:** The implementing agency, through the education coordinator, should develop an annual award to recognize local residents, businesses and institutions for their successful and innovative source reduction and recycling efforts.

(2) **The County and municipal governments, as well as other municipal agencies, should encourage source reduction activities whenever possible.** One example would be to hold a waste alternative fair. The object of this fair would be to educate people regarding what alternatives they could use at home or work to reduce the amount of waste they generate.

(3) **County and municipal governments should encourage State and Federal officials and representatives to address the issue of source reduction in whatever means possible.**

TABLE 5

RESIDENTIAL WASTE REDUCTION SUGGESTIONS

Reduce Consumption

- Buy fewer goods, especially reducing consumption of items with high waste by-products such as single-serve food items.
- Reduce junk mail by writing to the Direct Mail Association, 6 E. 42nd St., New York, NY 10017, ask to be removed from their list.
- Cancel magazine and newspaper subscriptions that you don't read regularly.
- Use nonhazardous substances instead of commercial cleaners and pesticides (most contain hazardous materials). Concoct your own household cleaners with benign natural products (baking soda, lemon, vinegar, to name a few).
- Reuse plastic containers for food storage and for storage of small items around the home (nails, paperclips, coins, etc.). By refills in reusable or recyclable packaging.
- Rent or borrow infrequently-used items.
- Share journals and newspapers with family friends, and neighbors.

Use Reusable Products

- Use cotton diapers (a diaper service costs less than disposable diapers).
- Use non-disposable dishes, containers, and cutlery.
- Use cloth napkins and reusable coffee filters.
- Use refillable pens and mechanical pencils.

Avoid Unnecessary and Excessive Packaging

- Buy products with the least amount of packaging.
- Avoid non-recyclable packaging.
- Avoid restaurants which use disposable packaging, or carry your own reusable containers.
- Purchase products in reusable or refillable containers. Bring containers to stores which offer non-packaged products (e.g., food cooperatives, meat markets, bakeries, the bulk food sections of grocery stores). Reuse bags and boxes when shopping (including plastic bags for vegetables and fruits). Carry a basket when buying produce (most produce does not need to be bagged at the store, although it is helpful if it is kept separate from other groceries).
- Buy the largest amount you can use. This is an example of "less packaging." A large container uses less material for packaging than several smaller containers.
- Avoid highly processed or prepared foods, which tend to be accompanied by a lot of packaging.
- Can freeze or dry favorite fruit and vegetables.

Extend Product Lifetimes

- Use both sides of paper.
- Purchase more durable products even if you have to pay a little extra.
- Fix broken appliances, toys and clothing rather than buy new items.
- Have a yard sale or take items no longer wanted or needed, but which may still have useful value, to charitable organizations (e.g., Salvation Army or Goodwill) which collect, repair, and sell second-hand goods.
- Shop at second-hand stores. This helps guarantee a market for second-hand goods.

Regulation

(1) **Champaign County should adopt a procurement ordinance that encourages the use of products with recycled content.** This ordinance can be modeled on the ordinances that have been adopted by Champaign and Urbana. The ordinance should be adopted as soon as possible.

(2) **All public agencies should consider adopting procurement procedures that encourage the use of products with recycled content.** These agencies include school districts, park districts, the forest preserve district, mass transit district, public health agencies, housing agencies, sanitary district and any other independent public or quasi-public agency. Local governments should also have entities, such as the Economic Development Corporation and the Convention and Visitor's Bureau, consider such procurement policies.

(3) **County and municipal governments, as well as other municipal agencies, should require that all departments complete a waste audit.** This report will determine areas of potential waste reduction. Each department can then institute appropriate changes in their purchasing and disposal practices. Waste audits would be done on an annual basis. Data collected would then be used to show local businesses the benefits of waste audits. This type of program should also be available to private businesses and offices as a service through the implementing agency. The implementing agency should develop the audits and teach local government staff how to conduct them. The audit should be developed within 1 year.

(4) **County and municipal governments should require that the ultimate disposal costs be calculated as part of their procurement process.** Part of this regulation should include guidelines and goals for the purchase of recycled products. School districts, park districts, the forest preserve and similar agencies should be targeted to adopt this type of activity.

Toxicity Reduction

The next goal of source reduction is toxicity reduction. Toxic waste, such as lead acid batteries, paints, pesticides and other household hazardous waste, increases the risks and costs of disposal. This type of material should be removed before processing or landfilling. It is this material that contributes to the hazardous seepage problems at landfills.

The ISWDA has sponsored two household hazardous waste collection events, one in 1987 and one in 1988, as a way to reduce the amount of hazardous waste in the wastestream. The events were successful and the amount collected per participant was 5 to 9 times higher than the national average. However, the cost per event is high. In Champaign County, the 1987 event cost about $80,000.00, and the 1988 event cost about $67,000.00. The Illinois EPA sponsored three collection events in 1988 to study the feasibility of funding such events. Of the three sites, Homewood, Illinois is the most comparable to Champaign-Urbana. The cost per pound at the Homewood collection was $1.27 while the cost at the Champaign-Urbana collection in 1987 was $2.18 per pound and in 1988 it was $3.16 per pound. The events were operated basically the same, and it is difficult to determine why the costs were different.

The high costs associated with these collection events and the small population they serve does indicate that this type of event should not be relied upon as the sole method of reducing the toxicity in a community's wastestream. There are several alternatives that should be investigated to augment a Household Hazardous Waste Collection Event.

Education

(1) **As part of the education program materials for point-of-sale displays should be developed to inform consumers of the type of hazardous waste in their home.** Proper disposal methods should be included in all the information. A poster similar to the one distributed by poison centers would be a good model. In fact, incorporating the proper disposal methods into a poison chart may be one method of distributing this information.

(2) **A separate publication on the alternatives to hazardous waste should be made available through local offices.** This publication would focus on what substitutes the consumer can use for such common household items as tile cleaners, pesticides, drain cleaners and other household hazardous waste.

(3) **Implementation of toxicity reduction should be coordinated with other community groups.** Since the toxicity of household material affects other groups, solicitation of funding for toxicity reduction efforts should include these groups. The groups that could be included are garbage haulers, local hospitals, retailers

and others. Funding for some, or all, of the collection event and the other educational material and publications could come from these sources.

(4) **County and municipal governments should encourage the introduction and passage of bills at the State and Federal level that address the issue of toxicity reduction.** Groundwater contamination and air pollution does not follow political boundaries and local concern and effort should extend beyond those boundaries in any manner possible.

(5) **A permanent program for Household Hazardous Waste should be developed by 1992.** Consideration should be given to the following options:

1) More frequent single, day collection events
2) A permanent drop-off site either a single centralized site or several sites
3) A mobile drop-off facility
4) A curbside collection program

A funding source should be identified with any program recommendations made. Until a program is implemented, annual collections should continue.

Alteration of the Wastestream

The third goal of source reduction in the context of this plan is to alter the wastestream to make it more processible as it moves through the solid waste management system. Source reduction techniques can encompass programs that include such concepts as recycling or reuse. If people cannot reduce the amount of waste generated, then they should be educated and assisted to make choices that will "fit" into the system. Since recycling is the second item in the State of Illinois' waste hierarchy, encouraging consumers to make choices that will make the wastestream more recyclable is one of the goals of these recommendations.

Education

(1) **The education program should include information on the recyclability of items in all program material.** Development of POS displays to inform consumers of the "recyclability" of various items would be appropriate. Expansion of the Model Community Program could become the implementing agency's responsibility.

(2) **All retail and wholesale outlets using bags for the conveyance of purchases should be encouraged to use paper bags first.** Plastic bags can be available, but should be specifically requested by the purchaser before being used. The use

of paper bags with recycled content is encouraged. The use of paper bags, which can be recycled through several avenues in the County, is an important gesture. This gesture will keep the issue of source reduction, recyclability and toxicity reduction in a visible position. Stores should encourage customers to reuse bags or to use cloth bags. This could be done through a pay-back program. Where the customer receives a refund since the store did not have to use a new bag. Stores offering plastic bags should have a recycling program for the used bags.

Regulation

(1) **The implementing agency should review the possibility of instituting bans, surcharges and deposits on any potentially recyclable materials, including household hazardous waste, two years from the date of this plan's adoption.** The review with recommendations should be completed within one year of the review's beginning date. A report with recommendations, including specific ordinance wording should be presented to the implementing agency's board or council. Any specific legislation must be developed in conjunction with the appropriate member government staff.

Within the review, specific attention must be given to the different powers related to enforcing such actions among home-rule and non-home rule entities. The review must also quantify any economic impacts on local businesses. If bans are to restrict a material from mixed waste, a market impact assessment must be performed. This will identify if there are existing markets for the material and if those markets can absorb any anticipated increase in that material.

Industrial Source Reduction

The economy in Champaign County is primarily service oriented with the University of Illinois and Chanute Air Force Base being the largest employers. In 1986, 58% of all jobs held were in either the service industry or retail trade. Eating and drinking establishments and health services were the largest job categories. In 1986, approximately 17.5% of all people employed in Champaign County worked in manufacturing (County Business Patterns, 1986). Industrial waste comprised 7% of the County's total wastestream in 1988. Of the 13,026 tons of industrial waste generated in 1988, 16% or 5,933 tons were recycled.

Amending existing procedures to include waste reduction should be the first step in the process of addressing industrial waste reduction. After monitoring these recommendations, the development of new regulations should be examined.

To address waste reduction at the industrial level, the following steps are recommended.

Education

(1) **The implementing agency should develop a voluntary waste audit program for local businesses.** The program would consist of staff visits to facilities to assist businesses and industries in determining where and how they may be able to reduce their waste generation and toxicity levels or to alter their waste to make it more processible. This program could be based on the waste audit system currently operated by Metro in Portland, Oregon.

Regulation

(1) **Local governments should include solid and hazardous waste generation issues as part of their community and economic development efforts.** Development of a waste disclosure report should be investigated. It would be part of the review process within the economic development and planning departments of member governments. This disclosure report would identify the types and quantity of waste the business in question would generate. Special attention should be given to any potentially hazardous or special waste. Information from existing facilities or industrial standards may be used, with appropriate adjustments, to complete the disclosure reports.

The cost and effort to develop this information could be the sole responsibility of the proposed firms' owners, just as preparation of site plans and other material required for planning review.

This information would be included in every phase of review **especially when tax incentives or other financial incentives are discussed.** This will insure that the cost of waste disposal (especially any hazardous or special waste) is included in the decision to award any type of financial incentives. A copy of the waste disclosure report would be sent to the implementing agency for review, comment and verification.

The report's format should be developed in conjunction with local governments by the implementing agency within 2 years of the plan's adoption.

(2) **The County and municipal governments should encourage efforts to reuse existing structures in the community as much as possible.** This could include expanding the "House Recycling" program, as exists in Champaign and Urbana, to the County and other towns. Providing one contact person to assist people in the completion of arrangements for moving homes may also make the process easier and more appealing to the general public.

Another activity could be a review of demolition permits. Demolition permits should have a waiting period, except in cases where there is a significant safety risk. The

waiting period would allow the appropriate agencies to review options for the structure. Possibilities such as reuse, relocation or salvage potential could be determined. The Preservation and Conservation Association of Champaign County (PACA) currently operates an architectural salvage warehouse. An official mechanism to notify and allow PACA access to a property to salvage materials could also be incorporated into the process. If other salvage firms or organizations develop that would reuse brick, block, lumber, etc, then those firms could also be allowed to divert the construction/demolition debris from the wastestream. Using an existing organization, such as PACA, to coordinate these salvage efforts should be considered.

(3) **The creation of a construction material recycling center should be investigated.** This could be operated as one of the municipally funded programs or separate funds could be raised. This facility could also function as a paint exchange for homeowners. Leftover paint could be brought to the center and sold, given away or disposed of properly. The implementing agency should develop a report on the feasibility of operating such a center within 3 years of the plan's adoption.

(4) **There should be a municipally sponsored Small Quantity Generator Program.** Development of a program will allow more municipal control over small quantity hazardous waste disposal in the community (See Appendix Two for an explanation of the program). Among the services this program could provide is assistance with proper disposal of hazardous or special substances and improved emergency response. This control becomes increasingly important when municipally owned facilities become operational. Reduction of hazardous waste in the wastestream can assist in reduction of the municipalities' liability in the future. Implementation should occur within 3 years of the plan's adoption, provided an appropriate funding source has been identified.

APPENDIX ONE

Calculations for Reduction Figures

CALCULATION OF PERCENT REDUCTION OF PAPER, GLASS AND PLASTIC

1990 Conservation by a Family of Four to Freeze Total Waste at 1988 levels.

1990 pounds of waste per family of four without conservation = 9183 pounds
1990 pounds of waste per family of four with conservation = 9081 pounds
Weight of waste conserved = 102 pounds

1990 Percent Reduction of Paper, Glass and Plastic.

Weight of waste conserved = (Weight of paper * Fraction of waste conserved)
+ (Weight of glass * Fraction of waste conserved)
+ (Weight of plastic * Fraction of waste conserved)

$$102 = 1943x + 397x + 402x$$
$$x = 0.03720$$

x = Fraction of waste conserved or approximately 4%

2010 Conservation by a Family of Four to Freeze Total Waste at 1988 Levels.

2010 pounds of waste per family of four without conservation = 9826 pounds
2010 pounds of waste per family of four with conservation = 8731 pounds
Weight of waste conserved = 1095 pounds

2010 Percent Reduction of Paper, Glass and Plastic.

Weight of waste conserved = (Weight of paper * Fraction of waste conserved)
+ (Weight of glass * Fraction of waste conserved)
+ (Weight of plastic * Fraction of waste conserved)

$$1095 = 2226x + 455x + 461x$$
$$x = 0.34850$$

x = Fraction of waste conserved or approximately 3.5 %

CALCULATION OF PERCENT REDUCTION OF PAPER, GLASS AND PLASTIC

1990 Conservation by a Family of Four to Freeze Individual Generation at 1988 Levels.

1990 totals of pounds of waste per family of 4 = 9183 pounds
1988 totals of pounds of waste per family of 4 = 9125 pounds
Weight of waste conserved = 58 pounds

1990 Percent Reduction of Paper, Glass and Plastic

Weight of waste conserved = (Weight of paper * Fraction of waste conserved)
+ (Weight of glass * Fraction of waste conserved)
+ (Weight of plastic * Fraction of waste conserved)

$$58 = 1943x + 397x + 402x$$
$$x = 0.02115$$

x = Fraction of waste conserved or approximately 2.1%

2010 Conservation by a Family of Four to Freeze Generation at 1988 Levels.

2010 totals of pounds of waste per family of 4 = 9826 pounds
1988 totals of pounds of waste per family of 4 = 9125 pounds
Weight of waste conservation = 701 pounds

2010 Percent Reduction of Paper, Glass and Plastic.

Weight of waste conserved = (Weight of paper * Fraction of waste conserved)
+ (Weight of glass * Fraction of waste conserved)
+ (Weight of plastic * Fraction of waste conserved)

$$701 = 2226x + 455x + 461x$$
$$x = 0.22311$$

x = Fraction of waste conserved or approximately 22%

APPENDIX TWO

Small Quantity Hazardous Waste Generator Program

From the

Solid Waste Management Feasibility Analysis for Champaign County, City of Champaign and City of Urbana

May 9, 1988

Brown, Vence & Associates

3.3 RECOMMENDED POLICIES AND MANAGEMENT OPTIONS

Based on survey data regarding current SQG hazardous waste generation, available programs and education level, the following policies and management options should be considered for implementation in Champaign County region. All options are based on the prioritization of waste minimization and recovery to reduce the percentage of waste that is landfilled. The SQG Hazardous Waste Management Program should be designed to fully utilize the existing programs that are cited in Section 3.2 so as to reduce program costs.

Large generators have historically received more regulatory scrutiny because they are more visible to regulators and the public. They play a major role in urban economies and the large size of their individual waste streams provides for economies of scale in waste management. Large generators generally do not experience difficulty in obtaining information, and most larger businesses consider the expense of waste management to be a cost of doing business.

Smaller commercial and industrial generators, however, often lack awareness about hazardous waste management. Many businesses cannot afford to educate themselves on the legal requirements for proper waste management. These businesses enjoy few economies of scale in waste treatment and disposal. Options such as reliance on treatment, storage and disposal (TSD) facilities located hundreds of miles away can drive such businesses into bankruptcy. These problems differ in scale, more than in kind, from problems faced by large generators. The development of an appropriate and feasible small generator program will be a challenge for Champaign County. The economic burden of compliance must be minimized to the degree possible.

Recommendation

It is recommended that the Association in the first phase identify an enforcement agency and a subsequent agency staff person for SQG programs, endorse the Waste Management Hierarchy (Reduction and Recycling before incineration and landfilling), review the local regulatory environment to ensure program support, clarify state and local roles, and assess the degree of sophistication and support desired for the SQG program elements. Also, to the greatest degree possible, the Association should involve from the start trade associations, state agencies, area recyclers and volunteers before establishing more complex new programs that will require greater financial commitment.

Recommendation Cost: Staffing, 1 full time Small Quantity Generator Program Specialist, $22,000-$25,000, (Plus benefits) 0-2 years experience

3.3.1 Common Policy Themes

- o Focus on educational and technical assistance for smaller generators. A regulatory program is important for ensuring compliance by the companies that may choose not to comply, but education should be the primary method for achieving this goal. Bringing small quantity generators into compliance involves taking a number of steps, and a primarily nonregulatory focus.

  - First, there must be the development of awareness regarding the careful identification and management of hazardous materials and wastes. An education program should convey the nature of the problem and the legal responsibilities of the individual firm, as well as the economical options for safe management and disposal.

  - Second, once educated, many smaller businesses will need technical and in some cases financial assistance to implement specific hazardous materials and waste management steps that ensure compliance.

  - Third, once in full compliance, attention can be focused on reducing the generation of hazardous wastes and in finding safer substitutes for specific hazardous materials.

- o Contact between the designated Agency and small generators through the appropriate business associations. To the maximum extent possible:

  - Enlist the assistance of more experienced large generator programs to help smaller generators meet their responsibilities, and

  - Utilize the existing resources of business and trade associations to foster cooperation and information/technologies sharing among small and large businesses.

- o Develop and continuously refine an accurate and comprehensive database for SQG hazardous materials and waste management. The database helps to ensure compliance, provides a means for setting program goals and measuring program success, and helps to determine on-site and off-site waste management needs.

Although hazardous waste regulations establish often artificial distinctions between large and small commercial/industrial generators and between small generators and households, in reality a continuum of needs exists among all generators for education, technical assistance, and appropriate facilities. Champaign County currently has strong public participation in its residential recycling program which may result in the spirit carried into the SQG program.

The following policy recommendations are organized under separate headings in order to ensure full coverage. Each of the policy areas includes a statement of the problem, a statement of policy, and a set of specific recommended actions.

3.3.2 Policy Headings

1. City/County Compliance
2. Education/Information
3. Source Reduction
4. On-Site Waste Management
5. Offsite Waste Management
6. Illegal Disposal
7. Eliminate Hazardous Waste from Waste Stream
8. New Waste Streams
9. Special Programs
10. Jurisdictional Coordination

Policy 1 - City/County Compliance

The designated agency should ensure that all City and County agencies are in full compliance with state and federal hazardous waste storage and handling requirements.

Actions — Bring all city and county agencies into full compliance.
Cost: No Direct Cost to ISWDA; potential cost to individual member governments.

Policy 2 - Education

Public participation is important to inform and educate the public regarding hazardous waste issues, assure timely approval of the management plan, and pave the way for decisions regarding the need and location of future treatment, storage and disposal facilities.

The designated agency should make efforts to educate small quantity generators.

As the local survey indicated, SQGs in Champaign County have a low level of awareness about hazardous waste management options. SQGs, therefore, may not be fully utilizing existing options and/or are participating in illegal and environmentally unsound disposal practices (i.e., dumping chemical waste in the sewer).

Policy 2.1 An education program should be sponsored by the designated enforcement agency. The purpose of an education/information program is to:

- Increase awareness of and compliance with hazardous waste regulations that affect SQGs
- Educate SQGs on the identification and proper management of hazardous waste
- Encourage the minimization, recycling, reuse, and proper disposal of hazardous materials
- Increase awareness of management options and resources available to SQGs

Information should be distributed to SQGs on regulations, procedures, and available management options. The objective of increasing SQG awareness is to eliminate the occurrence of illegal disposal and increase awareness of the effects of illegal disposal. While many educational tools can be utilized by the agency to conduct an information campaign, three options have been selected for reviewby the Association:

- Workshops/Seminars
- Newsletters, pamphlets
- Hotline

1. Workshops/Seminars - In conjunction with the Illinois ITA program and local trade associations, conduct informational meetings to disburse information. Training can be provided by ITA, so that the Agency's SQG staff member can give seminar presentations. Advertising the event could be done through trade and business associations and local newspapers. Cost per event depends on sophistication of program (i.e., renting hotel conference room vs. using a donated space), and utilization of existing resources. Costs could be offset by charging a registration fee to participants.

2. Newsletters - Produced in house or under contract, or shared with trade or business associations. These publications will contain articles on hazardous waste definition and identification; management options available, regulations, technical assistance and Hotline numbers, penalties for noncompliance, management tips.

The newsletter can be designated in various degrees of sophistication and proportionately, cost. Costs for a simple newsletter, in a quantity of 3,600, would range from $500-$1,000 per monthly issue. Varying degrees of sophistication would affect cost. This figure assumes that text has been provided by agency staff, and does not includ subsequent agency overhead expense. If copywriting, research, layout, etc. were to be contracted out, cost would increase dramatically, with $3,000-$4,000 per month being possible.

It is important that the information spark the interest of the SQG if the newsletter is to be effective. Sample is attached in Appendix 5.3.6.

3. Pamphlets/booklets - A pamphlet acts as an "on-hand" set of guidelines for SQG's dealing with hazardous waste. The pamphlet can include much of the same information as newsletters, but will cover the issues more in depth. Again, cost depends on the complexity of the publication. Assuming a simple brochure in a quantity of 3,600, the price would be about $400 per run. Again, cost varies with style and format, and assumes client supplied text. If copywriting is contracted out, add an additional cost of $1,000-$2,000, and increase with degree of sophistication.

4. Hotline - A special phone line to provide Small Quantity Generators with information and assistance on a call-in basis is another way to provide the facts about hazardous wastes handling and disposal. Three national hotlines are available for SQG's:

- RCRA/Superfund Hotline
  1-800-424-9346
- EPA Small Business Ombudsman
  1-800-368-588
- Illinois Industrial and Technical Assistance Program
- 217-333-8940
- National Resource Center
  1-800-424-8802

A local hotline would have staff capable of answering questions on SQG regulations, haulers and available management programs and options. The local program could either operate (A) from its own database, or (B) serve as a liaison between the small businesses and available resources. Obviously, an independent hotline will be more costly. Such a program for the North Hollywood, CA Pilot Program (Final Report, Southern California Association of Governments, 1985) was estimated at approximately $240,000 for initial cost. This figure assumes a hotline active for 24 hours a day (operators and answering machines) reference materials, data base (computer), office equipment, telephone services, and costs, and 2 full-time operators (at engineer level). These costs may vary significantly depending on program sophistication. Champaign County should implement a simpler 8-hour hotline (B) at first, staffed by the designated agency's SQG specialist, and assess further financial commitment based on the response generated.

Once plans are made to establish the program, it should be publicized by the following:

- News releases to local media (newspapers, television, radio);
- Contact with business and trade associations may offer donation of office space and equipment, publicity at meetings and in newsletters, use of staff or members volunteers;
- Flyers distributed;
- Reference the Hotline in your newsletter and brochure;

- Posters;
- Utility bill inserts.

Education Program Costs: $5,000-$25,000 per year; $5,000, using existing staff and available materials, increasing to a possible $25,000, which would include the salary of a Part-Time Public Affairs Specialist and the production of various materials and advertising.

Policy 3 - Source Reduction

Public agencies, institutions and private sector generators should seek every opportunity to reduce the actual generation of hazardous waste.

Source reduction is the major means for reducing the need for off-site waste management capacity, and for meeting the land disposal law requirements of state and federal law. Source reduction can reduce the use of hazardous materials and thus reduce any problems related to complying with the necessary requirements.

Policy 3.1: The Association should make a strong and visible commitment to the waste management hierarchy in general, and to the primacy of source reduction as the foundation of long-term future waste management programs. The "hierarchy" is a focus on source reduction as a priority, followed by recycling. The lower priorities of the hierarchy are incineration and landfilling, which are minimized to the degree possible by reduction and recycling.
Cost: No Direct Cost

Actions:

A. The County of Champaign and the Cities of Champaign and Urbana should adopt resolutions endorsing the waste management hierarchy in general, specifically the primacy of source reduction.
Cost: No Direct Cost

B. By resolution, establish a model program of source reduction for City and County agencies. Key elements should be a safe substitutes policy for hazardous materials purchasing.
Cost: No Direct Cost

C. The County and Cities should establish programs to review hazardous materials purchasing for use by local agencies and the use of simple audits to identify reduction opportunities.
Cost: No Direct Cost

Policy 3.2: A strategy should be developed for incorporating source reduction into efforts to educate generators.

Action:

A. The Association should develop, in two phases, a program to provide technical assistance to small quantity generators on source reduction:

- Use materials provided by the DENR Industrial Technical Assistance Program, and urge action by trade associations to identify basic source reduction options with an emphasis on education and technical assistance.

- Use trained Agency staff to provide direct technical assistance in identifying specific source reduction options.
Cost: No direct cost, utilizing designated SQG staff Specialist.

Policy 3.3: Current land-use planning mechanisms should be reviewed to determine if any requirements should be added specific to source reduction.

Action:

A. Review ordinances developed by other counties that have strong source reduction components to determine if source reduction can be made a requirement of land-use permits. Santa Cruz, California, under the Tanner Legislation Hazardous Waste Management Plans, is focusing heavily on requiring businesses to reduce hazardous waste

at the source. The requirement is a part of the land-use permits, and a local ordinance. This type of a strategy is fairly new.
Cost: No Direct Cost

Policy 3.4: Data collection and management is a key element of the source reduction effort, both in order to verify compliance with local, state and federal requirements, and to improve estimates of on-site and off-site waste management needs and capacities.

Action: A. Institute a data collection program for use by County and Cities.
Cost: $10-25,000 for consulting services, depending on level of program sophistication.

Policy 4-On-Site Waste Management

Following source reduction, proper methods for managing generated wastes on-site should be the next order of priority. Because they may not understand legal requirements and their compliance needs for on-site management, small quantity generators need several forms of assistance.

Policy 4.1: Officially acknowledge on-site waste reduction techniques to be the preferred next step after source reduction. Determine current on-site management patterns and general awareness of requirements.

Action: A. Utilize the technical assistance program to educate and assist small quantity generators with on-site reduction options.
Cost: No direct cost, utilizing existing resources and Education Program.

Policy 4.2: Focus on small quantity generators to determine whether there are applicable on-site management techniques, or whether off-site management should in all such instances be encouraged.

Action: A. Seek assistance from the Illinois Environmental Protection Agency or the DENR's HWRIC-ITA in determining the types of small

business and the types of waste streams for which, due to cost, complexity, or small volumes of waste, off-site management will generally be preferable to on-site management.
Cost: No direct cost, using SQG staff Specialist.

Policy 5 - Off Site Waste Management

Policy 5.1: Actively promote the availability of a collection and transfer facility to serve small quanitity generators. Unless convenient, economic disposal options are provided, generators cannot be expected to manage their wastes in an environmentally sound manner, no matter how much education and regulation is provided. Consideration should also be given to:

- Use by households and/or farms
- Use by neighboring counties
- Facility location (at landfill, industrial site)
- Costs
- Public or private sector development and operation

Action: A. Work directly with large generators, the University and trade associations to promote development of a transfer station within the County.
Cost: $25-50,000 for an initial feasibility study of an SQG transfer station, depending on facility sophistication.

Policy 5.2: Implement policies to assist in providing all SQGs with economically feasible means for recycling, treating, and disposing of hazardous wastes that cannot be reduced at the source. Several options currently available that could be better utilized include recyclers (like Safety Kleen), haulers and other waste management firms listed by the ITA Manual (Appendix).

Actions: A. Work through trade associations to determine whether small generators need a milk run pickup service (usually a for-profit

organization), and the feasibility of establishing and funding such a service.
Cost: No direct cost, utilizing SQG staff Specialist.

B. Work with trade associations and large quantity generators to establish cooperative waste management and disposal activities.
Cost: No direct cost, using SQG staff Specialist.

Policy 5.3: Coordinate with private sector and other Counties on the availability of recycling, treatment, and disposal options that cannot be provided within the County.

Action: A. Negotiate cooperative agreement with private sector and other county(ies) to provide for, and to ensure the access for Champaign County generators to recycling, treatment and residuals disposal capacity that cannot be provided within the County.
Cost: No direct cost

Policy 5.4: Emphasize the collection, management and coordination of data regarding proper off-site waste management as crucial to ensure compliance with applicable laws.

Action: A. Refine the collection and management of data on an ongoing basis to improve estimates.
Cost: No direct cost, utilizing existing database and SQG staff Specialist.

Policy 6 - Illegal Disposal

Lack of awareness and economical, convenient disposal or recycling options are the probably the two major causes of illegal disposal. Both of these factors can be of particular importance for a county such as Champaign in which there are few well-developed programs or nearby management options. Providing education and alternatives to meet waste management needs will go a long way towards reducing this risk. These issues are also addressed in several of the policy areas.

Cost and inconvenience will still drive some businesses to take actions that endanger public health and safety and the environment. For these reasons, a strict enforcement presence is critical to compliance.

Policy 6.1: Include discussion of illegal disposal regulations and enforcement mechanisms in education programs.

Action: Utilize information program to minimize illegal disposal.
Cost: No direct cost, utilizing SQG Staff Specialist and information program.

Policy 7 - Eliminate Hazardous Waste From the Solid Waste Stream

In order to eliminate hazardous waste from the municipal waste stream enforcement mechanisms need to be established. Currently in Champaign County, illegal disposal regulations are loosely enforced.

Policy 7.1 Establish a "Waste Acceptance Control Program" (WACP) that includes developing procedures and inspection provisions at the point of collection and at the landfills for keeping smaller commercial and industrial volumes of hazardous waste from entering the municipal solid waste stream.

Actions: Using the preliminary guidelines set forth and working closely with the EPA and landfill workers, implement a WACP program.

Preliminary Guidelines for establishing a Waste Acceptance Control Program (WACP)

The purpose of a WACP is to identify and remove hazardous waste from the municipal solid waste stream. Currently, no such program exists at the Urbana or Rantoul Landfills. A local commitment to enforcement needs to be emphasized.

In order to segregate hazardous waste from solid waste stream and identify SQG's who are disposing illegally, inspections of incoming waste need to be made; and landfill/TSD

customers need to be made aware of the program. The following steps need to be taken to establish a waste control program.

1. Customers need to be made aware of new procedures.

2. A waste inspector(s) needs to be designated, from the existing staff or new hire, to inspect incoming loads for unacceptable waste. Other employees handling waste should also be trained to identify unpermitted waste. Loads should be randomly inspected each day, with several very thorough inspections over the course of the year.

3. When unacceptable waste is detected, WACP staff should identify the material, hauler and the generator. Hazardous waste should then be handled as per RCRA and IEPA regulations.

4. After the identification process, the generator, the hauler, and the enforcement agency should be notified. Notification should include reasons that waste was not accepted at a solid waste landfill.

Staffing Needs for WACP

a. Staff training
b. Refuse load inspector(s)
c. Regulatory staff to review permits and determine acceptability
d. Public information specialist
e. Administrative staff

Regulatory, Public Information, and Administrative Staff can be shared from other programs sponsored by the Agency. Interns and volunteers can be recruited to operate hotlines and handle other responsibilities to offset program cost.

The cost of a WACP depends largely on a variety of elements, including the support from designated enforcement agencies, and the sophistication of desired program. Before a budget can be determined the Association must consider establishing an enforcement

apparatus and a mechanism to deal with illegally disposed waste once it has been identified and refused by the municipal solid waste stream. Options for management and proper disposal need to be available and economically feasible. High costs for alternative disposal may act as disincentive for proper disposal.

The Association needs to address these considerations prior to establishing a WACP so as to avoid the high legal costs that will be incurred if the program is established without a sound regulatory foundation. As with many of the programs, costs are volatile, depending on public acceptance, political pressure, regulatory changes, and economic fluctuation.

Cost: $23-25,000 per year, (Plus benefits), 1 full time staff person with entry level waste characterization and regulatory experience

Policy 7.2: Ensure that there are no unpermitted discharges to sewer system, source waters or groundwaters.

Actions:

- o Review adequacy of efforts by the Cities and Urbana-Champaign Sanitary District to monitor and detect illegal discharges to sewer systems.

- o Review adequacy of coordination between County agencies and the Illinois Environmental Protection Agency (IEPA) regarding permitting discharges to water.
  Cost: No Direct Cost

Policy 7.3: Minimize contamination resulting from illegal disposal of hazardous waste on real property within the County.

Action:

- o Develop efficient, responsive procedures for County removal of small quantities of illegally-disposed waste discovered.
  Cost: No Direct Cost

Policy 7.4: Review adequacy of data collection to detect and prevent illegal disposal.

Actions:

- o Coordinate data to detect and prevent illegal disposal.
  Cost: No Direct Cost

Policy 8 - New Waste Streams

New waste streams are created when wastes previously considered to be nonhazardous are reclassified as hazardous. Because Illinois has special waste regulations that require most nonhazardous industrial waste to be manifested, it is unlikely the changes in U.S. EPA classifications would affect Champaign County in this way. Second, new industries and the use of new or different processes and hazardous materials can result in the generation of new waste streams.

Policy 8.1: Track state and federal listing, delisting and variance processes through contact with the State EPA.

Actions:

- o Develop procedures for reviewing periodic updates from the IEPA regarding significant changes in the regulation of hazardous and special wastes and agricultural chemicals, including changes that result in more stringent or less stringent regulation of specific wastes or wastewater.

- o Develop a mechanism to keep the private sector informed of any applicable changes identified.
  Cost: No direct cost, utilizing staff Specialists

Policy 9 - Coordination With Other Jurisdictions

Champaign County clearly cannot manage its hazardous waste in isolation from other counties. There is a need for established relationships with other jurisdictions to address mutual hazardous waste management concerns. Promotion of a transfer station in Champaign County or a treatment facility in a neighboring county could be a cooperative activity among two or more adjacent counties.

Coordination with other Illinois counties can serve these purposes:

1. Sharing of data on import and export of hazardous waste between the generating county and the receiving county in order to continuously improve the assessment of needs and to remain aware of changes in availability of capacity.

2. Sharing of technical information on implementation of local hazardous waste programs which can make program start-up easier by learning from the experiences of others.

3. Cooperation on implementation of programs of mutual benefit; e.g., public education aimed toward small quantity generators.

4. Cooperation on promoting the development of a TSD facility that meets regional needs.

Action: Develop liaison with neighboring counties for information and resource sharing.
Cost: No Direct Cost

3.4 IMPACT OF VOLUME REDUCTION AT LANDFILL

3.4.1 Impact of Dumping on Wastewater and Environment

While the percentage of the waste stream comprised of small quantity generated hazardous waste seems quite low, its occurrence poses problems in varying degrees of severity. Studies conducted at landfills across the country indicate that hazardous waste can be found in the waste stream and soil adjacent to dumping sites, and have caused problems ranging from injuries and illnesses of disposal workers to the breakout of fires.

The National Solid Waste Disposal Association conducted a survey of its membership regarding the occurrence of hazardous waste in the waste stream. Almost half of the incidents noted involved a fire or explosion of some kind; more than half were observed during collection and hauling; about 50% involved quantities of under 10kg and approximately 30% weren't quantified. There was a slightly greater number of injuries

due to contact with hazardous materials reported by publicly-owned refuse services than private firms.

It should be noted, too, that records and data regarding SQG Hazardous Waste are insufficient, and many incidents of injury etc. are not reported. Also, little is known about the effects of SQG hazardous waste dumping on soil and into sewers. Due to the lack of information available conclusions are conservative.

In addition to fires and injuries to disposal workers, improper disposal of hazardous waste contributes to potential groundwater contamination. The degree of potential contamination depends on the waste composition, the landfill construction and nature of the surrounding land. There is just cause to eliminate hazardous waste from the waste stream by implementing a source reduction program. Because SQG Hazardous Waste comprises a small fraction of the waste stream, a reduction program won't result in a significant difference in the tonnage of MSW. It will, however, contribute to increased worker safety and the protection of the environment and public health.

Many of the SQG's surveyed in Champaign County indicated that a method of disposal sometimes practiced was dumping oil, solvent, etc. down the sewer drain. The subsequent contaminated waste water poses the threat of injury to sanitary district workers and contamination of the environment. Increased awareness of SQG's, the availability of convenient and economical disposal options and strict enforcement, would contribute to a significant decrease in this problem.

3.5 FINANCING OPTIONS

Various mechanisms are available to the Association to finance elements of the Hazardous Waste Management Program for Small Quantity Generators: Service Charges, Generator Fees and Public/Private Grants.

- Service Charges - The Cities and Urbana-Champaign Sanitary District could levy a service charge on residents or commercial establishments via utility bills. This amount does not have to be an increase, but can be a budgeted percentage of fee revenues. If a fund does not already exist from such service charges, a minimal increase in refuse collection or

sewer fees could provide funds for a pilot program or, if desired, on an on-going basis. For example, the City of Palo Alto, California utilized wastewater and refuse collection fees to fund the household hazardous waste collection program. The Palo Alto program is a budgeted item, jointly funded by utilities and public works, and administered by utilities. The cost per resident for the household hazardous waste disposal program is $6.00 per year per household. The program does not include small businesses, and services about 1% of the area's 16,000 households, but offers a good example for funding mechanisms utilized. While the participation rate of the Palo Alto program is seemingly low, it is growing.

- o Generator Fees - If the Association opts to implement a technical assistance program with on-site inspection, the program could also include a requirement for SQG's generating a hazardous or special waste have a hazardous materials permit. The County and Cities could require that a fee be paid by the SQG in order to obtain the Hazardous Materials Permit.

- o Public/Private Grants - Grants are available from time to time through public agencies and private companies for the funding of various waste management programs. The designated agency's assigned SQG staff person would monitor grant listings and apply for relevant grants.

Action: The Association should contract the services of a finacial advisor, after reviewing and approving SQG programs, to assess the best and most economical means of financing the program.
Cost: $10-25,000 depending on level of program organization and sophisticaton.

3.6 PROGRAM COST SUMMARY

The Cost of the SQG program in its entirety depends largely on a number of factors:

- o The degree of sophistication of program elements selected by the Association;
- o Support from designated regulatory/enforcement agencies; and a sound enforcement mechanism in place;
- o Utilization of existing resources;
- o Availability and selection of funding options;
- o Results of further study.

In total, the SQG Program costs could range from no cost (assuming the use of all existing staff and resources, with minimal program sophistication); to $250,000. (Assuming action on all recommendations given here, at high end costs). A median range for a program adhering to the recommendations herein, utilizing low end cost estimatees, would be $95,000. A comprehensive cost review can be found in Table 3-7.

All costs given are based on industry estimates and costs for existing programs, and do not include miscellaneous administrative costs incurred by the County, Cities or the Association. Salaries and benefits of the SQG Program staff have been included.

3.7 WAYS TO REDUCE PROGRAM COSTS

Program costs can be controlled or reduced by taking a number of steps introduced throughout this section: maximizing on existing resources; recruiting volunteers or interns instead of full time paid staff; using "in-kind" services and requesting donations from community-oriented large firms; expanding the waste exchange for material recycling; and supporting education and source reduction programs, thus reducing the magnitude of hazardous waste in the waste stream.

3.8 RECOMMENDATIONS SUMMARY

In light of the information discussed in Sections 3.1 to 3.7, the Association should undertake the following:

1. Identify an enforcement agency for SQG Programs.
2. Designate, from that agency staffmember(s) who will work directly with SQG programs.

3. Review the local regulatory environment to ensure program support.
4. Clarify state and local roles for a clear understanding of authority and responsibility.
5. Coordinate with trade associations, state agencies, area recyclers, environmental groups and volunteers to establish a sound foundation of cooperation and utilize existing resources.
6. Officially endorse educational and technical assistance for small quantity generators, as well as the waste management hierarchy emphasizing source reduction and recycling.
7. Develop and maintain an accurate and comprehensive database.
8. Ensure the compliance of all City and County agencies.
9. ~~Sponsor an information program to increase the awareness of SQGs.~~
10. Develop a strategy for source reduction, including the provision of technical assistance.
11. Review land use planning mechanisms for source reduction potential.
12. With large generators and trade associations, actively promote the availability of a storage/transfer station within the County.
13. Implement policies to assist SQGs with economical options for recycling, treating and disposing of hazardous waste. These could include special "milk run" pick-up services and cooperative activities.
14. Emphasize enforcement mechanisms in information/education efforts.
15. Establish a Waste Acceptance Control Program (WACP) as an element of enforcement.
16. Ensure that unpermitted discharges to sewer system, source waters or groundwater are minimized.
17. Ensure that illegal disposal on real property is minimized.
18. Monitor for new waste streams.
19. Coordinate with other jurisdictions for information sharing and the economical handling of problems that cannot be resolved within the County.
20. Enlist the assistance of a financial advisor to assess economic conditions and those funding mechanisms most appropriate for the County and Cities.
21. Engage in further study of the problem of SQG hazardous waste in Champaign County region, as close to the source as possible.

Table 3-6
Small Quantity Generator (SQG) Hazardous Waste Programs

Policies/Programs	No Direct Cost	One-time Cost (x $1000)	Annual Cost (x $1000)
Regulatory Environment			
Identify the Designated Agency	x		
Review Local Regulatory Environment	x		
Clarify State & Local Roles	x		
Ensure City & County Compliance	x		
Hire Staff Specialist			
Hire SQG Coordinator			$30 - $35
Building Blocks for Waste Management			
Reduce, Recycle, Energy, Landfill	x		
Develop Source Reduction Program	x		
Promote SQG Transfer Station		$25 - $50	
Establish "Milk-Run" Desirability	x		
Reducing Future Impacts			
Implement Ongoing Education Program			$5 - $25
Review City & County Purchasing	x		
Provide Technical Assistance to SQGs	x		
Review Land Use Planning Mechanisms	x		
Minimize Illegal Disposal	x		
Ongoing Management			
Institiute Data Management Program		$10 - $25	
Coordinate for Out-of-County Wastes	x		
Establish Waste Acceptance Program			$30 - $35
Monitor Sewer Discharges	x		
Monitor & Control New Waste Streams	x		
Coordinate with Other Jurisdictions	x		
Total		$35 - $75	$65 - $95

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APPENDIX 3

Waste Audit: *Example*

WASTE AUDIT

- Prepare a background material for the assessment.
- Conduct a preassessment visit to identify candidate wastestreams.
- Select wastestreams for detailed analysis.
- Conduct a detailed site visit to collect data on selected wastestreams and controls and related process dates.
- Develop a series of potential waste minimization options. This could include option to reuse, recycle or reduce the toxicity of the selected wastestreams.
- Undertake preliminary option evaluations (including development of preliminary cost estimates).
- Rank options by:
  - waste reduction effectiveness;
  - extent of current use in the industry
  - potential for future application at the facility.
- Present preliminary results to personnel along with a ranking of options.
- Prepare a final report, including recommendations to management.
- Develop an implementation plan and schedule.
- Conduct periodic reviews and updates of assessments.

(Source: EPA 1987)

Will become Appendix 3, Part II, Source Reduction

APPENDIX 4

Source Reduction: *Program Costs*

Source Reduction
Program Costs

Residential, Commercial, & Industrial Waste

	Capital Costs	Annual
1) Education Program		$ 66,500
Printing/Displays		$ 10,000
Professional Development		$ 1,000
Transportation (in-county)		$ 2,000
Promotion (including Media Purchases)		$ 20,000
Postage		$ 2,000
		$ 101,500[1]
2) Waste Audits		
Development (software, etc.)	$ 5,000	
Promotion		$ 15,000
Postage		$ 1,500
Printing/Reports		$ 10,000
	$ 5,000	$ 26,500

Household Hazardous and Small Quantity Generator Waste

3) Household Hazardous Waste Collection[2]		
Annual, 1-Day Event		$175,000
Promotion		$ 10,000
		$185,000
4) Small Quantity Generator Program[3]		
Development	$ 35,000-$ 75,000	
Annual Costs		$ 65,000-$ 95,000
Total Estimated Costs	$ 40,000-$ 80,000	$365,500-$396,500

1 Current education efforts cost an estimated $80,000/year.

2 These costs may vary if a different type of Hazardous Waste Program is selected.

3 See Part II, Appendix 2, p. 2-21, for detailed discussion of these costs.