

OFFICE

ReCYCLING

HANDBOOK



Environmental Protection Agency
& General Services Administration

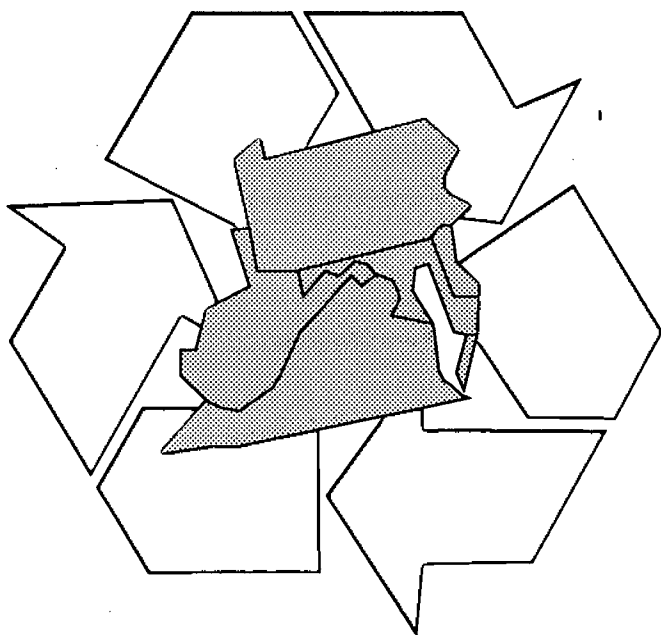
REGION III

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OFFICE

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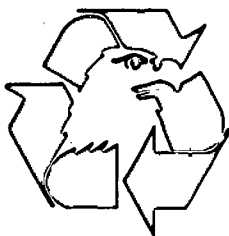
HANDBOOK



RECYCLE TODAY
FOR TOMORROW

ACKNOWLEDGEMENTS

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**THIS HANDBOOK IS PRINTED ON RECYCLED
PAPER USING LEAD-FREE AND NON-TOXIC INKS**



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INTRODUCTION

This handbook is meant to evoke thought and provide assistance toward initiating a recycling program in your office. It is imperative that we understand the importance of recycling as a means of decreasing our dependence on current waste disposal methods such as landfills. As we move into the twenty-first century, we must work together to promote conservation of our natural resources, and recycling can help achieve that goal.

Office recycling programs provide an excellent opportunity to make a considerable impact on the quantity of waste that needs disposal. A successful program requires a number of simple steps. This handbook is offered as a guide to help you get started and outlines methods to develop an effective program. The methods presented here can be adopted by any office including federal and state agencies as well as private companies. In addition, a glossary of common terms and a list of contacts and publications, which may be useful in program development are provided. Included as appendices are several forms useful as tools to define the scope of your recycling program and to help determine the benefits your company will derive from recycling. Recycling today for tomorrow is a necessary step toward protecting our valuable natural resources and can provide economic benefits.

OFFICE TRASH OR CASH?

The volume of office waste discarded each day is staggering. On average, office workers generate approximately 1.5 pounds of office waste daily, comprised mostly of paper (office bond, memo paper, computer printouts, and copying paper). We have become a "throw away" society discarding waste materials with little thought to the impact this immense quantity of waste has on our environment and the economy.

Today we are confronted by a national solid waste crisis. Historically, the usual method of disposing office waste has been landfilling. In 1988, we disposed of 180 million tons of trash, and this amount continues to increase each year. The number of operating landfills nationwide has decreased from 18,500 in 1979 to 6,500 in 1988. It is projected that by the year 2000 there will be only 3,250 operating landfills in the United States. The landfills that remain open will increase their tipping fees, and associated shipping costs will rise as waste gets hauled over greater distances. These market-driven factors will result in increased disposal fees for every waste generator. Landfills are no longer acceptable or feasible as the single disposal option. We must find viable alternatives to arbitrarily throwing things away. One effective method is recycling.

For decades, resources that could have been recycled have been lost. Forty-one percent of the waste sent to municipal landfills is paper, and it is estimated that 85 percent of that waste is recyclable. In environmental terms, recovery of paper will result in the conservation of 5 million cubic yards of landfill space, 3 million barrels of crude oil, and 26 million trees a year. In other words, recycling contributes to the conservation of valuable resources.

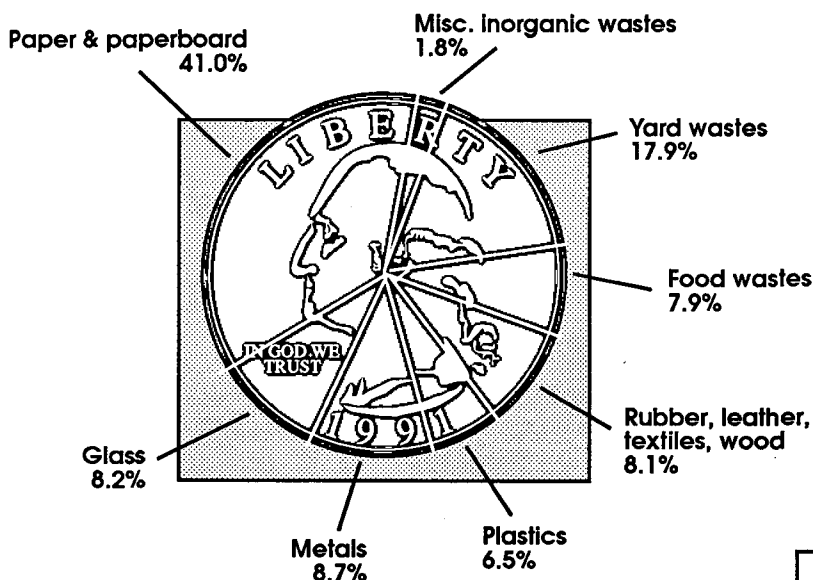
The problem all of us now face is what to do about the enormous volume of waste generated daily. If we want to control and inhibit the rapid destruction of our natural resources, we must adopt new attitudes and habits. We cannot afford to ignore the waste problem and hope it will go away. As disposal costs skyrocket, recycling becomes increasingly cost-effective. By reducing the amount of trash, waste disposal costs may decrease or stabilize. In addition, recycling will generate revenue which will offset collection costs while providing a new source of income.

The Code of Federal Regulations, Title 40, Part 246, requires that all federal agencies that generate solid waste take action to recover that resource. Compliance with this federal regulation is not the only regulation that will require the federal community to recycle. An Executive Order is being proposed to mandate that all federal agencies source separate and purchase recycled content products.

On the local, county, and state levels, legislation has been passed which also mandates recycling. These legislative actions and Executive Orders will help achieve a 25 percent recycling goal by 1992.

As private citizens we can follow the government's lead by developing a daily routine of recycling. It is not only good citizenship, in many jurisdictions, it is the law. More local governments are passing legislation that requires recycling. Many of us already recycle at home, and this habit can be transferred to the work place. Once a simple system is in place, recycling will become second nature, and we can all derive a sense of pride from contributing to the conservation of natural resources as well as saving money.

Recycling is particularly suited to the work place because most office waste is paper. Many large corporations have already instituted recycling programs, which have continually proven that recycling is a cost-effective method of managing waste paper and is relatively easy to implement. This office recycling handbook outlines some of the steps in achieving that goal. Its purpose is to provide practical assistance and to foster awareness about alternatives to current waste management practices. This handbook is designed for the facility or office manager who has accepted the challenge to find responsible and cost-effective answers to our solid waste crisis.



WHAT IS RECYCLING?

Most of us are familiar with the term "recycling," but may not fully understand the concept. Recycling is reusing materials that still have a useful physical or chemical property, which after having served their original purpose, can replace raw materials. The most common items recycled are aluminum cans and paper. Using products made from recycled materials is also an important component of a successful program.

It is irresponsible to continue destroying forests in order to produce paper when paper is easily recycled. It makes no sense to bury in the ground materials that can be reused. Plastic soft drink containers are a good example of materials that should be recycled rather than discarded in landfills because these items require a lot of space.

The need for landfills will not be completely eliminated by recycling. We can, however, substantially decrease our dependence on this waste disposal method by reducing the quantity of waste we send to the landfill. Recycling provides environmental benefits as well as an economic tool for reducing projected costs for routine disposal.

Recycling is just one component of an integrated waste management system hierarchy. Other hierarchy components include:

- ☐ Source reduction
- ☐ Landfills
- ☐ Incineration

Source Reduction is the first level in the hierarchy and focuses on minimizing the volume and toxicity of the waste.

Recycling is the next level and shifts valuable resources from landfills and incinerators back to the manufacturers. The recycling process is not complete until recycled materials are purchased by the consumer.

Landfills and Incineration are the third and fourth levels in the integrated waste management system. The Environmental Protection Agency specifies no ranking preference; each is ranked depending on region, resources, and demographics.

STEP 1: GETTING STARTED

SELECTING A RECYCLING COORDINATOR

A successful recycling program is based on three key elements: concern, learn, and return. Designing an effective and efficient program requires forethought and organization. The first step is to select a Recycling Coordinator who will be responsible for setting up and managing the recycling program. An enthusiastic coordinator ensures a successful program. The coordinator will act as a liaison among management, recycling monitors, janitorial services, the recycling collector, and the waste hauler. The coordinator should possess good communication skills, effective organizational skills, and a thorough understanding of the recycling program.

Role of the Recycling Coordinator

- ☐ Initiates the program
- ☐ Implements employee education program
- ☐ Encourages employee participation
- ☐ Tracks progress of the program
- ☐ Evaluates the program on a monthly basis
- ☐ Develops program reports
- ☐ Coordinates with the Recycling Monitors

SELECTING RECYCLING MONITORS

After the Recycling Coordinator is selected, the next step is to select monitors for each floor of the office. The selection process for Recycling Monitors demands the same consideration of skills as for the coordinator. The monitors will serve as the contact person for the coordinator. Certainly, a well-designed program with enthusiastic and knowledgeable monitors is critical to a successful recycling program.

Role of the Recycling Monitors

- ☐ Assist the coordinator in education and promotion campaigns
- ☐ Encourage employee participation
- ☐ Ensure that recycling containers are free of nonrecyclable trash
- ☐ Notify Recycling Coordinator of aesthetic problems



STEP 2: SURVEY WHO THROWS AWAY WHAT

After a coordinator and monitors have been chosen, the next step in program development is to determine the scope of the recycling program. It will be necessary for the office manager and the designated coordinator to perform a waste survey, which should consist of the steps listed in the graphic below.

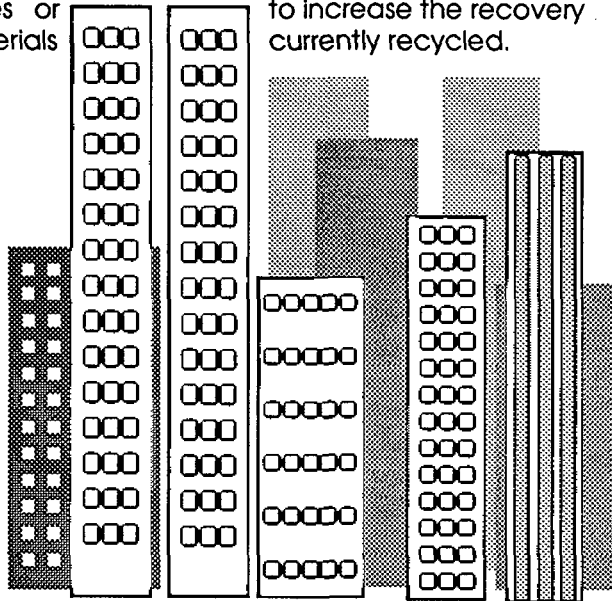
A number of forms and worksheets are provided as appendices to this handbook. These forms and worksheets can be used to input data collected on building tenants (Appendix A) as well as information useful in assessing current waste hauling costs (Appendix C). In addition, two worksheets are provided to assist in calculating total waste generated (Appendix B) and to calculate the costs and benefits of your recycling effort (Appendix D).



EVALUATE THE TENANT BASE

Data on building tenants are critical to designing an effective recycling program. Various building statistics and an assessment of client requirements will be needed. The building profile sheet (see Appendix A) is a simple form which can be used to organize the data collected on the total number of employees, departments, and floors in the building. At this point in the program development process, special waste disposal needs should be identified. Special needs could include the necessity to incinerate certain paper waste due to security requirements of some tenants.

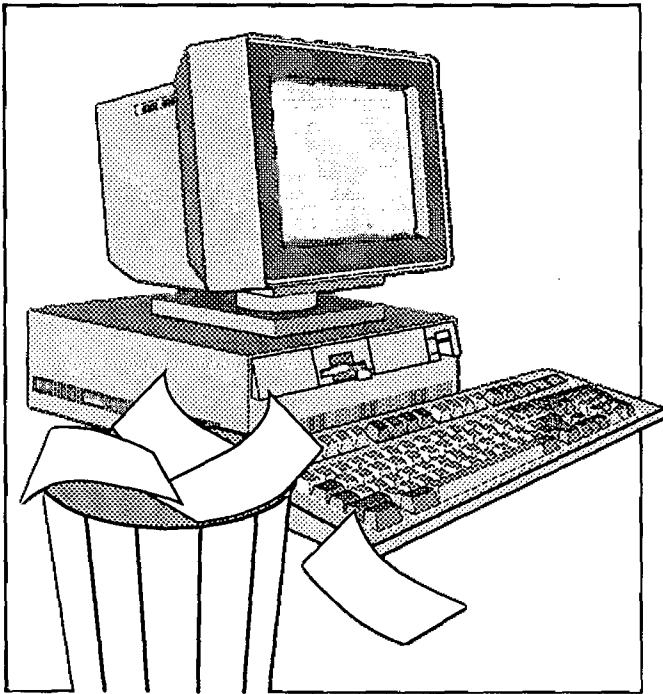
This evaluation should measure the who, what, and where of solid waste generation. It will provide the necessary information on the components of the waste stream, which will assist the Recycling Coordinator in determining the scope of the recycling effort. Building managers should research janitorial and trash collection costs, collection days, number of pickups per week, and quantity of trash picked up each month (estimated size of the container). In buildings where there are existing recycling programs, the waste audit process can be used to determine if the program should be expanded to other recyclables or to increase the recovery rate of the materials currently recycled.



VISUAL SURVEY

A survey should be conducted of trash cans on each floor, particularly those near computer stations, copiers, and copy rooms. Listing the most common items found will help to determine items that can be recovered for recycling. Do not limit your recycling program to paper products; aluminum soft drink cans are also a valuable recyclable. Another important item to consider for inclusion in a recycling program is glass. Obviously, paper represents the bulk of office waste; however, including aluminum and glass in the recycling program may offer additional economic benefits.

The visual survey step should also focus on the aesthetic element of the recycling effort. Management may be concerned about the aesthetic quality of the containers; therefore, the appearance of the workplace should be considered when choosing and placing the containers.



KNOW YOUR LOCAL RECYCLING RESOURCES

Becoming familiar with the local recycling market is critical to program success. Many cities have recycling programs with coordinators located in Solid Waste Management Offices who can provide current information on local recycling efforts. Included at the end of this handbook is a list of contacts who can provide useful information about recycling. Building managers should also talk to local and state government officials. Other important contacts are local waste haulers, who usually have information on prices and procedures for pickup of recyclable materials. The first waste hauler to contact may be the one who is currently contracted for your building. This contractor may also provide a recycling collection service.

SPECIAL CONSIDERATIONS

Be aware of local fire codes: they contain guidelines for storage of waste paper. Incorporating fire regulations into your recycling program during its development will save you time and possible inconvenience later. The requirements are easy to follow and usually include safety information such as storage area specifications (e.g., they must be enclosed, and bins containing flammables must have lids). In addition to fire safety codes, pest control must be considered. The designated storage area should be kept neat and free of excess debris to avoid creating a pest problem.

STEP 3: WHAT MATERIALS TO RECYCLE?

Completing Step 2 will provide a better understanding of what is being thrown away and what materials can be salvaged. The following information presents an overview of some of the most commonly recycled materials.

COMMONLY RECYCLED MATERIALS

☐ Paper

Waste paper recycling has several benefits: it provides mills with a valuable fiber source, it provides income to recyclers, and it reduces municipal disposal costs. According to the American Paper Institute, in 1986, 200 of the nation's 600 pulp, paper, paperboard, and building products mills relied almost exclusively on waste paper for raw material, and another 300 used at least some waste paper in their operations (API, 1986; note: a large amount of this waste paper was industrial scrap). As more recycling programs come on line and the supply of scrap paper increases, the paper industry is expected to respond by developing more facilities that handle secondary fiber.

Old Newspaper (ONP). Most recycling programs have provisions for collecting old newspaper, which is one of the most prevalent materials in the municipal solid waste stream, and has historically been one of the most commonly recycled materials.


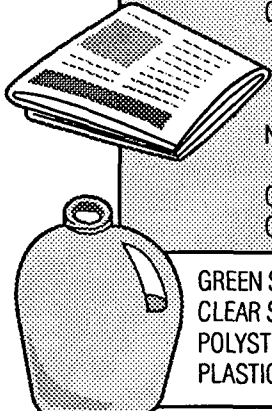
Corrugated Cardboard. According to the American Paper Institute, corrugated cardboard is the largest single source of waste paper for recycling (API, 1985). Many office supplies are packaged in corrugated cardboard containers. Rather than discarding these, they should be an element of the recycling program.

High-Grade Paper. High-grade papers include office bond, computer paper, white ledger paper, and key punch cards. The market for these materials has historically remained steady because good quality products (i.e., few colored paper mixtures, binders, plastics, etc.) can be used as a direct substitute for wood pulp.

Mixed Paper. Mixed paper is usually collected from office buildings and industrial plants. Mixed paper often contains significant quantities of high-quality paper, which can be valuable if separated. However, "contaminant" materials such as rubber bands, inks, and coatings, decrease mixed paper value, and should be removed during the collection process.

□ Aluminum

42.5 billion of the 77.9 billion aluminum cans produced in 1988 were recycled (Salimando, 1989). The demand for recycled aluminum is high, as it takes approximately 95 percent less energy to produce an aluminum can from an existing can than from ore (Keep America Beautiful, Inc., 1989). Consequently, aluminum is a high-value product and is the greatest revenue generator of many recycling programs.

	MATERIAL CATEGORIES	EXAMPLES
	ALUMINUM CANS TIN CANS ALUMINUM FOIL	soda & beer cans soup & pet food cans pie plates, foil
	GREEN GLASS CLEAR GLASS BROWN GLASS	beer & wine bottles jars, clear window glass liquor & beer bottles
	CORRUGATED CARDBOARD & BROWN PAPER BAGS MIXED PAPER	double-walled cardboard school paper, junk mail cereal boxes, shoe boxes
	NEWSPAPER & MAGAZINES COMPUTER PRINTOUT OFFICE PAPER	anything that comes with your newspaper white office paper bond paper
	GREEN SODA BOTTLES CLEAR SODA BOTTLES POLYSTYRENE PACKING PLASTIC JUGS	plastic ginger ale bottles plastic cola bottles polystyrene p-nuts cider, water & milk jugs

□ Glass

Glass is also one of the most commonly recycled materials, and the market price for post-consumer glass has historically been steady. Glass is often separated by color to be reprocessed: clear, green and brown. Separation can take place in the office. After collection (or drop-off) and separation, glass bottles and jars are crushed into small pieces and then sold to end users, who mix it with sand, soda ash, and limestone to form new glass containers. Glass should be clean and free of contaminants such as metal caps, ceramics, rocks, and dirt.

□ Plastics

Plastics recycling is a relatively young industry, and only one percent of plastics is currently recycled. But as processing technologies are developed, plastics recycling is expected to expand. Although plastics recycling is not an established money-maker in many areas, the plastics recycling industry is in a stage of rapid growth.

PET (polyethylene terephthalate). Most plastic soft drink bottles are made of this material, which is the most commonly recycled plastic. The Plastic Bottle Institute reports a 20-percent rise in the number of plastic bottle recycling companies between 1987 and 1988. 150 million pounds of plastic soft drink bottles were recycled in 1987 (PBI, 1988).

HDPE (high-density polyethylene). Milk jugs and detergent bottles are the most easily identified HDPE products in the waste stream. Like PET bottles, this type of plastic is currently recycled and the HDPE market is growing as processing technologies are developed.

Mixed Plastics. Mixed or commingled plastics are unsorted materials including combinations of several plastic resins and "contaminants" such as paper, wood, metals, and glass. Mixed plastics processing is a developing technology, and markets for the material are expected to increase.

Other Plastics. Other plastics that could be recycled in greater quantities in the future include: polystyrene; polyvinyl chloride (PVC), polypropylene (PP), and low-density polyethylene (LDPE). Because

plastics recycling is such a new field, the recycling loop is not yet complete in many areas of the country. Significant progress must still be made in the collection, separation, processing, and purchasing of recycled plastics.

STEP 4: DETERMINE COLLECTION SYSTEM

After the scope of the recycling program has been determined, a method to reduce or eliminate contaminants in the recycling stream must be identified. Contaminants in the recycling stream can cause serious problems in the recycling process and can substantially lower the value of your recycled materials.

CONTAMINANTS IN THE RECYCLING STREAM

High & Low Grade Office Paper

The most frequently found contaminants in office paper are:

- ☐ Glossy paper
- ☐ Post-it Notes™
- ☐ Tape
- ☐ Carbon paper
- ☐ Blueprints
- ☐ Cardboard
- ☐ Pressure-sensitive labels
- ☐ Paper with insoluble glue (e.g., wrapping for copier paper)
- ☐ Envelopes with plastic windows
- ☐ Envelopes with pressure-sensitive flaps and labels
- ☐ Binder clips, metal fasteners, rubber bands (save for re-use)
- ☐ Food wrappings, cups, napkins, tissues

Corrugated Cardboard

Corrugated cardboard should be kept free of contaminants that adversely affect production efficiency and product quality. Contaminant-free corrugated waste paper also increases its value.

Common contaminants include:

- ☐ Polystyrene packing materials
- ☐ Plastic bags
- ☐ Trays used to package food items
- ☐ Plastic cups

Newspapers

In order to maximize the price that can be obtained for newspapers, they should be kept clean, dry, out of direct sunlight, tied in bundles or placed in paper bags, and free of contaminants. Contaminants include:

- ☐ Wire hangers or other metal objects
- ☐ Wax paper
- ☐ Aluminum foil
- ☐ Food
- ☐ Plastic bags
- ☐ Glass
- ☐ Wood and yard waste

Glass

Glass has a number of processing and handling requirements that must be followed in order to produce cullet (crushed glass) that is furnace ready (i.e., color-sorted and free of contaminants).

Depending on the hauler, glass may have to be separated by color (green, brown, clear). Color sorting is essential to guarantee color consistency in containers being made from recycled glass. Contamination is a serious concern of the glass container industry. Sources of contamination include:

- ☐ Metals (such as aluminum caps and steel lids)
- ☐ Stones and dirt
- ☐ Neck rings from bottles
- ☐ Ceramic cups, dishes and overware
- ☐ Light bulbs
- ☐ Plate glass, safety and window glass
- ☐ Heat-resistant glass
- ☐ Lead-based glass such as crystal or TV tubes

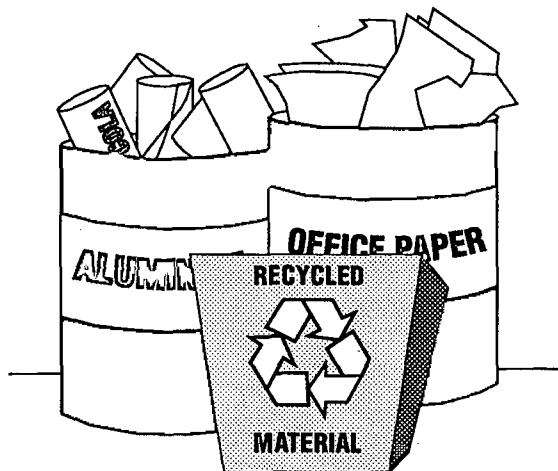
These materials can create serious problems in glass container manufacturing because they can appear in the containers being made, causing both structural and aesthetic problems. Ceramics and stones can create similar problems.

SOURCE SEPARATION METHODS

In order to avoid contaminants in the recycling stream, a source separation method should be adopted. There are several ways to source separate. Recycling programs typically use one of several systems to transfer materials from the individual to various office collection points. These include:

- ☐ **Desk top system** where the user places recyclable paper in a container on the desk and discards nonrecyclable waste in a waste basket.
- ☐ **Two waste basket system** where one basket is used for recyclable paper and the second for discarding nonrecyclable waste.

As these individual office units become full, each employee, or a custodian, deposits the materials in appropriate central collection containers. As a variation to the options above, vendors may offer services which enable mixed recyclables to be collectively stored for dealer pick-up and transport to processing centers.



- ☐ **Centralized office containers**, which accommodate a wide variety of office recyclables, including paper, glass, and aluminum, also can be used for separating office recyclables. Central collection containers are clearly identified bins, located in copy rooms or within individual office bay areas serving 15 to 20 persons.

Other centralized container options for materials such as glass or aluminum include large containers (often called "igloos") located outside the building, or containers located in lunchrooms or adjacent to well-trafficked areas. This central container concept can be expanded to collect newspapers or corrugated cardboard, among other materials. Custodians or building management staff—or in some cases outside contractors—transfer the materials from the central containers to bulk storage areas. The main storage area should be organized to minimize the accidental mixing of trash with segregated recyclables. The building manager and/or recycling vendor can assist in the selection of the main storage site. Keep in mind the following points when selecting a main storage site:

- ☐ Is the site large enough?
- ☐ Can the site be locked?
- ☐ Is the site protected with sprinklers?
- ☐ Is there a freight elevator easily accessible?

Once you have decided which method fits your needs, the next step is to decide types of collection equipment required. For example, a compactor or baler may be needed, and the type and size of the containers necessary to handle the expected volume of recyclables should be identified. Collection options will vary based on five decisions:

- ☐ What you choose to collect
- ☐ Which transfer system you will employ (where collection containers are located)
- ☐ Who transfers collected material
- ☐ What storage space and handling equipment is available

STEP 5: IMPLEMENT THE PROGRAM

EDUCATE EMPLOYEES

A successful office recycling program depends on employer endorsement and employee awareness, cooperation, and concern. Here are some suggestions to get a recycling program started.

- ☐ Develop a kickoff memo from top administration to all personnel outlining the importance and benefits of a recycling program. Appendix E provides sample kickoff memos which can be tailored to your company's or agency's specific recycling effort
- ☐ Provide a memo to all employees explaining how to sort recyclables
- ☐ Schedule an education seminar for management, employees, and maintenance staff
- ☐ Present information in the employee newsletter about progress on problem areas within the program
- ☐ Prevent excess accumulation of recyclables at container areas. Reinforce the recycling habit by maintaining the collection areas
- ☐ Present awards to those who do a particularly conscientious job

After the program has been implemented, routine evaluation meetings to review and improve the program should be conducted. This will aid in keeping open lines of communication and will provide a forum for suggestions to improve the overall success of the recycling effort.

MINIMIZE THE SOURCE

Source reduction is another strategy to decrease the generation of waste. Minimizing the source can be achieved in a number of ways. Consumer purchasing plays a key role in minimizing waste. It is important to purchase recyclable goods and products which come in recyclable packaging. Another way to reduce the volume of waste is to purchase goods made from previously recycled materials. Making intelligent purchases can lead to an overall reduction in the waste stream. Smart shopping also sends signals to manufacturers. If the demand for products made from recycled materials increases, manufacturers will find it necessary to rethink production methods. By eliminating or reducing the need for certain items, the volume of waste sent to the landfill is minimized, thus conserving diminishing landfill space. Source reduction in the office can be achieved through various methods including:

- ☐ Copying on two sides
- ☐ Reducing the number of copies routed in an office
- ☐ Using electronic mail to send interoffice memos
- ☐ Reusing scrap paper for notes and message pads
- ☐ Using materials that have a longer life span
- ☐ Posting information on announcement boards versus making multiple copies
- ☐ Using mugs instead of paper or polystyrene cups
- ☐ Avoiding disposable items. Use items that can be repaired, recycled, refilled, or reused
- ☐ Promoting the use of items that contain recycled materials, especially common office supplies

SUMMARY

Our natural resources are endangered and available landfill space is dwindling. Recycling is not only good citizenship, it makes good business sense. In the long run, it is more cost effective to reuse or recycle than it is to produce from virgin materials. In many jurisdictions, recycling is fast becoming law.

Recycling is easy and practical. Three important keys to recycling are concern, learn, and return. Environmental issues have found their way onto the front pages of newspapers and are often the topic of nightly news broadcasts. This increasing concern is the first step. The next step is to learn all you can about environmental issues and how recycling fits into the overall integrated waste management system hierarchy. The last and most important step is to begin a recycling effort. This requires not only returning materials to appropriate centers where the items can be substituted for expensive and disappearing raw materials, but purchasing products made from recycled materials.

This handbook offers simple steps and methods for developing and implementing an office recycling program. Recycling can become part of any organization's standard operating procedure. The greater the participation, the greater the success of the program. Enthusiastic employee participation will result in a more efficient and economical program. Recycling will reduce the amount of trash hauled away and will most likely result in lower disposal costs. If we all do our part, we can change attitudes about current waste disposal methods and prove that recycling is a viable waste management alternative.

GLOSSARY

Baler - A machine used to compress recyclables to reduce volume.

Biodegradable Material - Waste material which can be broken down by microorganisms into simple, stable compounds such as carbon dioxide and water. Most organic wastes -- food and paper -- are biodegradable although this process can take years in a landfill.

Bottle Bill - A law requiring deposits on beverage containers.

Broker - An individual or group of individuals who act as an agent or intermediary between the sellers and buyers of recyclable materials.

Buy-Back Center - A facility where individuals bring recyclables in exchange for payment.

Commercial Waste - Waste materials originating in wholesale, retail, institutional or service establishments such as office buildings, stores, markets, theaters, hotels, and warehouses.

Commingled Recyclables - A mixture of several recyclable materials into one container.

Compactor - Power-driven device used to compress materials to a small volume.

Composting - The controlled biological decomposition of organic waste under aerobic conditions.

Corrugated Paper - Paper or cardboard made in a series of wrinkles or folds, or ridges and grooves.

Curbside Collection - Programs where recyclables are collected at the curb, often from special containers.

Diversion Rate - A measure of the waste being diverted for recycling compared with total waste previously thrown away.

Drop-off Center - Collection site where wastes are taken and deposited into designated containers.

Garbage - Spoiled or waste food that is thrown away, generally defined as wet food waste.

High Grade Paper - Relatively valuable paper such as computer printout, white ledger, and tab cards.

Incineration - Burning at extreme temperatures to reduce volume reduction and/or recover energy.

Inorganic Waste - Waste composed of matter other than plant or animal (i.e., contains no carbon).

Integrated Solid Waste Management - A practice of using several alternative waste management techniques to manage and dispose of specific components of the municipal solid waste stream. Waste management alternatives include source reduction, recycling, landfilling, and incineration.

Manual Separation - Separation of recyclables from the waste stream by hand sorting.

Mechanical Separation - Mechanical separation of waste into components using cyclones, trammels, or screens.

Municipal Solid Waste (MSW) - Includes nonhazardous waste generated in households, commercial and business establishments, institutions, and light industrial process wastes, agricultural wastes, mining waste and sewage sludge. In practice, specific definitions vary across jurisdictions.

GLOSSARY

Post-Consumer Recycling - The reuse of materials generated from residential and commercial waste, excluding recycling of material from industrial processes that has not reached the consumer, such as glass broken during the manufacturing process.

Recyclables - Materials that have useful physical or chemical properties after serving their original purpose and can be reused or remanufactured into additional products.

Recycling - The process by which materials otherwise destined for disposal are collected, reprocessed, remanufactured, or reused.

Residential Waste - Waste materials generated in single- and multiple-family homes.

Reuse - The use of a product more than once in its same form for the same purpose; e.g., a soft-drink bottle is reused when it is refilled at the bottling company.

Sanitary Landfill - Solid waste land disposal site where waste is spread in thin layers, compacted, and covered with a fresh layer of soil each day to minimize pest, aesthetic, disease, air pollution, and water pollution problems.

Source Reduction - The design, manufacture, acquisition and reuse of materials so as to minimize the quantity and/or toxicity of waste produced. Source reduction prevents waste either by redesigning products or by otherwise changing societal patterns of consumption, use, and waste generation.

Source Separation - The segregation of specific materials at the point of generation for separate collection.

Special Waste - Items requiring special or separate handling, such as household hazardous wastes, bulky wastes, tires and used oil.

Subtitle D - The solid, nonhazardous waste section of the Resource Conservation and Recovery Act.

Subtitle F - Section of the Resource Conservation and Recovery Act (RCRA) requiring the federal government to participate in programs fostering recovery and use of recycled materials and energy.

Tipping Fee - A fee for the unloading or dumping of waste at a landfill, transfer station, recycling center, or waste-to-energy facility.

Transfer Station - Location where wastes are transferred from one collection vehicle to another for transport. Recycling and some processing may also take place at transfer stations.

Trash - Material considered worthless, unnecessary or offensive that is usually thrown away. Generally defined as dry waste, but is often a synonym used for garbage, rubbish, or refuse.

Volume Reduction - Processing waste to decrease the amount of space materials occupy, usually by compacting or shredding, incineration, or composting.

Waste Exchange - A computer and catalog network that redirects waste back into the manufacturing or reuse process by matching companies generating specific wastes with companies that use those wastes as manufacturing inputs.

Waste Reduction - Reducing the amount or type of waste generated. Sometimes used synonymously with source reduction.

Waste Stream - The total flow of solid waste from homes, businesses, institutions, and manufacturing plants that must be recycled, burned, or disposed.

CONTACTS

Aluminum Association, 900 19th Street, NW, Washington, D.C. 20006 (202) 862-5100

Aluminum Recycling Association, 1000 16th Street, NW, Suite 603, Washington, D.C. 20036 (202) 785-0951

American Paper Institute, 260 Madison Avenue, New York, NY 10016 (202) 340-0654

Association of State and Territorial Solid Waste Management Officials, 444 North Capitol Street, Washington, D.C. 20001 (202) 624-5828

Council on Plastic and Packaging in the Environment, 1275 K Street, NW, Suite 300, Washington, D.C. 20005 (202) 789-1310

Environmental Institute, a division of the Institute of International Research, 331 Madison Avenue, 6th Floor, New York, NY 10017 (212) 883-1770

Food Service and Packaging Institute, 1025 Connecticut Avenue, NW, Suite 513, Washington, D.C. 20036 (202) 347-3756

Glass Packaging Institute, 1801 K Street, NW, Suite 1105-L, Washington, D.C. 20006 (202) 887-4850

Government Advisory Associates, Inc., 177 East 87th Street, Room 404, New York, NY 10128 (212) 410-4165

Government Refuse Collection and Disposal Association, 8750 Georgia Avenue, Suite 123, P.O. Box 7219, Silver Spring, MD 20910 (301) 585-2898

Institute for Local Self-Reliance, 2425 18th Street, NW, Washington, D.C. 20009 (202) 232-4108

Institute of Scrap Recycling Industries, Inc., 1627 K Street, NW, Washington, D.C. 20006 (202) 466-4050

Keep America Beautiful, Inc., Mill River Plaza, 9 West Broad Street, Stamford, CT 06902 (203) 323-9897

National Association for Plastic Container Recovery, 5024 Parkway Plaza Boulevard, Suite 200, Charlotte, NC 28217 (704) 357-3250

National Association of Counties, 440 First Street, NW, Washington, D.C. 20001 (202) 393-6226

National Association of Towns and Townships, 1522 K Street, NW, Suite 730, Washington, D.C. 20005 (202) 737-5200

CONTACTS

National League of Cities, 1301 Pennsylvania Avenue, NW, Washington, D.C. 20004
(202) 626-3000

National Oil Recyclers Association, 2600 Virginia Avenue, NW, Suite 1000,
Washington, D.C. 20037 (202) 333-8800

National Soft Drink Association, Solid Waste Management Department, 1101 16th
Street, NW, Washington, D.C. 20036 (202) 463-6740

National Solid Waste Institute, 10928 North 56th Street, Tampa, FL 33617 (813) 985-
3208

National Solid Waste Management Association, 1730 Rhode Island Avenue, NW,
Suite 1000, Washington, D.C. 20036 (202) 659-4613

National Tire Dealers and Retreaders Association, 1250 I Street, NW, Suite 4000,
Washington, D.C. 20005 (202) 789-2300

Polystyrene Packaging Council, Inc., 1025 Connecticut Avenue, NW, Washington,
D.C. 20036 (202) 822-6424

Society of the Plastics Industry, 1275 K Street, NW, Suite 400, Washington, D.C. 20005
(202) 371-5200. Also, the Council for Solid Waste Solutions, a program of SPI.

Steel Can Recycling Institute, Foster Plaza X, 680 Andersen Drive, Pittsburgh, PA
15220 (800) 876-SCRI

Technical Association for the Pulp and Paper Industry, 15 Technology Parkway
South, Norcross, GA 30092 (800) 332-8686

U.S. Conference of Mayors, 1620 Eye Street, NW, 4th Floor, Washington, D.C. 20006
(202) 293-7330. Affiliate group: National Resource Recovery Association

FEDERAL CONTACTS

	Procurement	Marketing	Collection	Monitoring and Evaluation	Education	Program Management
RCRA Procurement Hotline (703) 941-4452 M-F 8:30 - 5:30 (EST)	✓					
EPA Headquarters RCRA Procurements POC: Richard Braddock (202) 382-2780	✓					
EPA Headquarters POC: Terry Grist Municipal and Solid Waste Division (202) 475-8518	✓	✓	✓	✓	✓	✓
EPA, Region III POC: Andrew Urlicheck Waste Management Branch (215) 597-0982	✓	✓	✓	✓	✓	✓
GSA, Public Building Service POC: Beverly Goldblatt, Building Services Branch Resource Recovery Program (202) 501-1456		✓	✓	✓		✓

POC = Point of contact

FEDERAL CONTACTS

	Procurement	Marketing	Collection	Monitoring and Evaluation	Education	Program Management
GSA, National Capital Region Building Services Branch POC: Stanley M. Ismark, Building Management Officer (202) 708-6948		✓	✓	✓	✓	✓
GSA Region 3 Facility Management Branch POC: George A.A. Shal Chief, Facility Management Branch (215) 597-1226		✓	✓	✓	✓	✓
GSA Region 3 Contracts Branch POC (MD, DE, VA, WV, KY): Rosemary Bradley, Contracting Officer (215) 597-5340	✓					
GSA Region 3 Contracts Branch POC (PA, NJ): Wayne Massado, Contracting Officer, (215) 597-3486	✓					

STATE CONTACTS

	Procurement	Marketing	Collection	Monitoring and Evaluation	Education	Program Management
Mr. Richard Folmsbee Director, Solid Waste Mgmt. Dept. of Natural Resources and Environmental Control 89 Kings Highway Post Office Box 1401 Dover, Delaware 19903 (302) 739-3820	✓	✓	✓	✓	✓	✓
Mrs. Susan Bush Director, Division of Waste Mgmt. 18 Reilly Road Frankfort, Kentucky 40601	✓	✓	✓	✓	✓	✓
Mr. Harry Benson Chief, Office of Waste Minimization and Recycling Hazardous and Solid Waste Management Administration Department of the Environment 2500 Broening Highway Baltimore, Maryland 21224 (301) 631-3315	✓	✓	✓	✓	✓	✓
Ms. Aletha Spang Administrator, Office of Recycling Dept. of Environmental Protection 8500 Bear Tavern Road (CN414) Trenton, New Jersey 08625-0414 (609) 530-4001	✓	✓	✓	✓	✓	✓

POC = Point of contact

STATE CONTACTS

	Procurement	Marketing	Collection	Monitoring and Evaluation	Education	Program Management
<p>Mr. Carl Hursh Chief, Waste Reduction and Recycling Division of Waste Minimization and Planning Bureau of Waste Management Fulton Building, Third and Locust Streets P.O. Box 2063 Harrisburg, PA 17105-2063 (717) 787-7382</p>	✓	✓	✓	✓	✓	✓
<p>Mr. Michael Murphy Recycling Program Manager Dept. of Waste Management Monroe Building 11th Floor Richmond, Virginia (804) 371-0044</p>	✓	✓	✓	✓	✓	✓
<p>Mr. R. Kim Pritchard Chief, Solid Waste Management 1356 Hansford Street Charleston, West Virginia 25301 (304) 348-6350</p>	✓	✓	✓	✓	✓	✓
<p>Mr. George Jenkins Recycling Coordinator 65 K Street, N.E. Office of Recycling - Lower Level Washington, D.C. 20002 (202) 727-5856</p>	✓	✓	✓	✓	✓	✓

PUBLICATIONS

"Cashing-in Through Recycling and a Multi-Material Recycling Theme Center," State of California Department of Conservation, Division of Recycling, 1025 P Street, Sacramento, CA 95814

The Coca Cola Company, Recycling, A Corporate Approach, undated

"Developing A Comprehensive Federal Office Recycling Program," U.S. Environmental Protection Agency, Office of Administration and Resources Management, 401 M Street, S.W., Washington, D.C. 20460 (202) 382-6980

Franklin Associates, Ltd, An Analysis of the EPA Headquarters Waste Stream, March 10, 1989

"The National Recycling Coalition Measurement Standards and Reporting Guideline," National Recycling Coalition, Suite 305, 1101 30th Street, N.W., Washington, D.C. 20007

Recycled Products Guide, American Recycling Market, Inc., P.O. Box 577, Ogdensburg, NY 13669 (800) 267-0707

Waste Age's Recycling Times, National Solid Waste Management Association, Suite 1000, 1720 Rhode Island Avenue, N.W., Washington, D.C. 20036-3196

PUBLICATIONS BY E.P.A.

401 M Street, SW, Washington, D.C. 20460

The documents listed below are available free. Please send your request to: RCRA Docket (OS-305), USEPA, 401 M Street, S.W., Washington, D.C. 20460.

Be An Environmentally Alert Consumer, EPA/530-SW-90-34A

The Environmental Consumer's Handbook, EPA/530-SW-90-034B

Recycle Today!, EPA/530-SW-90-025

Office Paper Recycling Manual, EPA/530-SW-90-001

Recycle, EPA/530-SW-88-050

Recycling Works!, EPA/530-SW-89-014

Bibliography of MSW Alternatives, EPA/530-SW-89-055

How to Set Up a Local Program to Recycle Used Oil, EPA/530-SW-89-039A

Recycling Used Oil: What You Can Do!, EPA/530-SW-89-039B

PUBLICATIONS

Recycling Used Oil: Ten Steps, EPA/530-SW-89-039C

Recycling Used Oil: Service Stations, EPA/530-SW-89-039D

Used Oil Recycling Bulletin, EPA/530-SW-89-006

Sites for Our Solid Waste, EPA/530-SW-90-019

Siting Promotional Brochure, EPA/530-SW-90-020

Report to Congress on Plastics: Executive Summary, EPA/530-SW-90-051A

Waste Minimization: Environmental Quality With Economic Benefits, EPA/530-SW-87-026, October, 1987.

Environmental Fact Sheet: Plastics In the Marine Environment, EPA/530-SW-90-017B

Environmental Fact Sheet: Plastics: Source Reduction, EPA/530-SW-90-017C

Environmental Fact Sheet, Plastics: The Facts About Production, Use, and Disposal, EPA/530-SW-90-017A

Environmental Fact Sheet: Degradable Plastics, EPA/530-SW-90-017D

Environmental Fact Sheet: Recycling Plastics, EPA/530-SW-90-029

Characterization of MSW Combustion Ash: Executive Summary, EPA/530-SW-90-029

RCRA Info Center - How to Find Hazardous & Solid Waste Information, EPA/530-SW-87-023

Waste Minimization: EQW/B, EPA/530-SW-90-044

A Catalog of Hazardous and Solid Waste Publications, EPA/530-SW-89-054.

Characterization of Municipal Solid Waste in the U.S. 1960 to 2000 (Update 1988).

Promoting Source Reduction and Recyclability in the Marketplace, EPA-530-SW-89-066, September 1989.

The Solid Waste Dilemma: An Agenda for Action, EPA/530-SW-89-019, February 1989.

Decision Maker's Guide to Solid Waste Management, U.S. Environmental Protection Agency, Office of Solid Waste, Washington, D.C. 20460

Yard Waste Composting: A Study of Eight Programs, EPA/530-SW-89-038, April 1989

APPENDICES

Weight To Volume Conversions

F

KICKOFF MEMOS

E

Costs/Benefits

D

WASTE HAULING

C

Waste Audit

B

BUILDING PROFILE

A

BUILDING PROFILE

Building #1 _____

Largest three agencies _____

Agency representatives _____

Phone numbers _____

Total number of employees in building _____

Number of floors _____

Number of loading docks _____

Storage space near dock? (Y/N) _____

Adequate fire protection (Y/N) _____

Existing recycling program? (Y/N) _____

Waste Removal

In-house staff _____

Contract staff _____

Pickup schedule

Daily _____ M_____ T_____ W_____ TH_____ F_____

Weekly _____

Number of containers _____

Capacity of containers _____

Recyclable materials:

Paper

Cans

Other

Current recycled materials

How much per wk./mo.

Participating floors

Number of boxes

Describe space available for central recycling

WASTE AUDIT

Total Waste Generation

$$1 \quad \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}} \text{ lbs.}$$

No. Employees (a) Avg. lbs. waste/
employee/day Waste/day (b)

$$2 \quad \underline{\hspace{2cm}} \times \frac{247 \text{ days}}{\text{Working days/}} \div \frac{12}{\text{mos.}} \div \frac{2,000 \text{ lbs.}}{\text{Lbs./ton}} = \underline{\hspace{2cm}} \text{ Tons/month}$$

Waste/
day (b)

Recyclable Paper Generation

$$3 \quad \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}} \text{ lbs.}$$

No. Employees (a) Avg. lbs. recyclable
paper/employee/day Recyclable
paper/day (b)

$$4 \quad \underline{\hspace{2cm}} \times \frac{247 \text{ days}}{\text{Working days/}} \div \frac{12}{\text{mos.}} \div \frac{2,000 \text{ lbs.}}{\text{Lbs./ton}} = \underline{\hspace{2cm}} \text{ Tons/month}$$

Recyclable
paper/day (b)

recyclable
paper

Potential Paper Recovery Rates

$$5 \quad \underline{\hspace{2cm}} \times \underline{65\%} = \underline{\hspace{2cm}}$$

Tons/month Employee
Recyclable paper (d) participation rate
(conservative rate) Tons/month
recyclable paper
recovered (e)

WASTE HAULING

Waste disposal company? _____

Size and number of waste containers? _____

Frequency of pickups? _____

Is waste on premises? _____ Cost of compactor? _____

Is compactor owned or leased? _____

Waste disposal cost per cubic yard? _____

Flat fee? _____ Other? _____

This section should help the facility manager to assess the current cost of waste disposal and whether the disposal bill reflects actual service. It is possible that fewer pickups may be needed, resulting in a reduced disposal bill. The waste hauler might also grant a credit if the waste is compacted.

The cost/benefits worksheet on the next page will give the facility manager an estimate of the costs and savings associated with office recycling programs. Some programs have generated substantial revenue, while others cost money but register trash disposal savings to offset the cost of starting a recycling program.

COSTS/BENEFITS

PRESENT DISPOSAL COSTS

	MONTHLY	ANNUAL
Waste bill(s)		
Confidential destruction costs		
Equipment costs (trash cans, compactor, etc.)		
Labor (janitorial) ¹		
Revenue from any current recycling program	<	>
TOTAL DISPOSAL COSTS		

AFTER PROGRAM IMPLEMENTATION

	MONTHLY	ANNUAL
Disposal costs adjusted downward to reflect reduced service ²		
Coordinator's time		
Central recycling containers		
Publicity		
Labor (extra janitorial or collection personnel costs)		
Compactor and related equipment		
Installation costs (one time)		
TOTAL COSTS		

REVENUE

	PRICE/TON ³	TONS/MO. ⁴	MONTHLY	ANNUAL
White paper				
Computer paper				
Cans/bottles				
Other credits				
TOTAL CREDITS				

NET RECYCLING PROGRAM COSTS
(TOTAL COSTS less TOTAL CREDITS)

SAVINGS

Present disposal costs	-	Net recycling program costs	=	Net savings costs
------------------------	---	-----------------------------	---	-------------------

- 1 Assign only a percentage of your janitorial costs since the janitors provide other services besides waste removal
- 2 Estimate how much your recycling program will reduce your waste stream, then call your disposal company to find the cost of less frequent service or smaller bins
- 3 Call a few waste paper dealers to get the current price of waste paper. Be sure to ask the dealer for a price that includes pickup services.
- 4 Refer to the Waste Audit (Appendix B) for the tons/month figure (e). Estimate how much of the total will be white paper, computer paper, and mixed paper.

CREDITS: This worksheet was adapted from the "Justification Worksheet" designed by George Luker of National Semi-Conductor, Santa Clara, California.

SOURCE: Your Office Paper Recycling Guide, The San Francisco Recycling Program, A Division of the Solid Waste Management Program, San Francisco, CA, 94102, (415) 554-6193, Jane Grossman (writer)



SAMPLE KICKOFF MEMOS

TO: (Agency Name) Managers
FROM: Jane Doe, Office Manager
DATE: February 15, 1991
SUBJECT: Office Paper Recycling at (Agency Name)

Effective _____, 1991, a recycling program will be implemented in _____ (agency name). This program will be very visible to both Federal employees and the citizens who visit this building. Your employees will be given instructions of how to participate and I trust you will encourage them in this endeavor.

The crisis in landfill availability, the waste disposal crisis, and the Resource Conservation & Recovery Act of 1976, mandating separation of office paper and newspapers require that all Federal agencies support a recycling effort. This program also presents an opportunity for every individual to participate in protecting our environment.

By separating high grade office paper, this agency can recover more than 50% of all waste leaving this building. By selling the paper, the taxpayers, us, will benefit by having the proceeds returned to the Government, and all citizens will benefit by reducing the volume of waste in our landfills and the waste streams, thus protecting the environment.

The program will be simple and effortless. A more detailed presentation of what constitutes a high grade paper will be scheduled later with attractive containers distributed to each employee to facilitate the source separation.

It is requested that you, as a _____ (manager) of your division, appoint a responsible monitor and an alternate as your contact with the agency recycling coordinator. The coordinator will be available to provide guidance and training. Please provide this coordinator with the support he/she needs to make this program a success.

The _____ (agency name) Office Paper Recycling Program needs your full support to succeed. I look forward to your cooperation and a successful recycling program in this (our) building(s).

SAMPLE KICKOFF MEMOS

TO: (Company Name) Employees
FROM: Jane Doe, Office Manager
DATE: February 15, 1991
SUBJECT: Office Paper Recycling at (Company)

Studies show that each office worker throws away an average of a half-pound of recyclable paper everyday. That's the equivalent of (___ tons) a year from our office alone. This means that over (___ trees) and (___ gallons of oil) are needed each year just to keep our office afloat in paper. We're starting a recycling program to put this paper to better use. By recycling, we'll lower our waste disposal costs, earn revenue from the sale of our paper, and do our part to improve the environment. In addition, a portion of the revenue earned from our program will go to ABC Charity.

Participation in this program will require only small changes in your daily habit. You will be given a desk-top container for storing white paper and computer paper. When your desk-top container is full, simply empty the contents into the central container nearest to your desk. The location of the central containers will be:

NEXT TO ALL OF THE COPY MACHINES
ROOMS 200, 319 AND 452
OUTSIDE THE COFFEE ROOM

Please attend a short orientation to learn more about how the program works. Three fifteen-minute sessions have been scheduled for March 1, 1991. The sessions will start at 9:30 AM, 10:30 AM, and 1:30 PM. Your supervisor has a sign up sheet.

Your participation in this program does make a difference! For every piece of paper you recycle, you will:

- . Protect the environment and save natural resources
- . Conserve scarce landfill space

If you have any questions about the program, please contact JOHN SMITH at X-4635. Thanks for your cooperation.

WEIGHT TO VOLUME CONVERSIONS

Material	Volume	Wt. in lbs.
Newsprint, loose	one cubic yard	360-800
Newsprint, compacted	one cubic yard	720-1,000
Newsprint	12" stack	35
Glass, whole bottles	one cubic yard	600-1,000
Glass, semi-crushed	one cubic yard	1,000-1,800
Glass, crushed (mechanically)	one cubic yard	800-2,700
Glass, whole bottles	one full grocery bag	16
Glass, uncrushed to manually broken	55 gallon drum	125-500
PET, soda bottles, whole, loose	one cubic yard	30-40
PET, soda bottles, whole, loose	gaylord ¹	40-53
PET, soda bottles, baled	30" x 62"	500
PET, soda bottles, granulated	gaylord	700-750
PET, soda bottles, granulated	semi-load	30,000
	30" x 42" x 48"	1,100
Aluminum cans, whole	one cubic yard	50-74
Aluminum cans, flattened	one cubic yard	250
Aluminum cans	one full grocery bag	1.5
Aluminum cans	one large plastic grocery bag	500-1,000
Corrugated cardboard, loose	one cubic yard	300
Corrugated cardboard, baled	one cubic yard	1,000-1,200
Grass clippings	one cubic yard	400-1,500
Used motor oil	one gallon	7
Tire - Passenger car	one	12
Tire - Truck	one	60

¹ Gaylord size most commonly used 40" x 48" x 36"

DRAFT National Recycling Coalition Measurement Standards and Reporting Guidelines
presented to NRC Membership October 31, 1989



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