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EC 90-428 Household Waste Management : Yours, Mine, and Ours Year One

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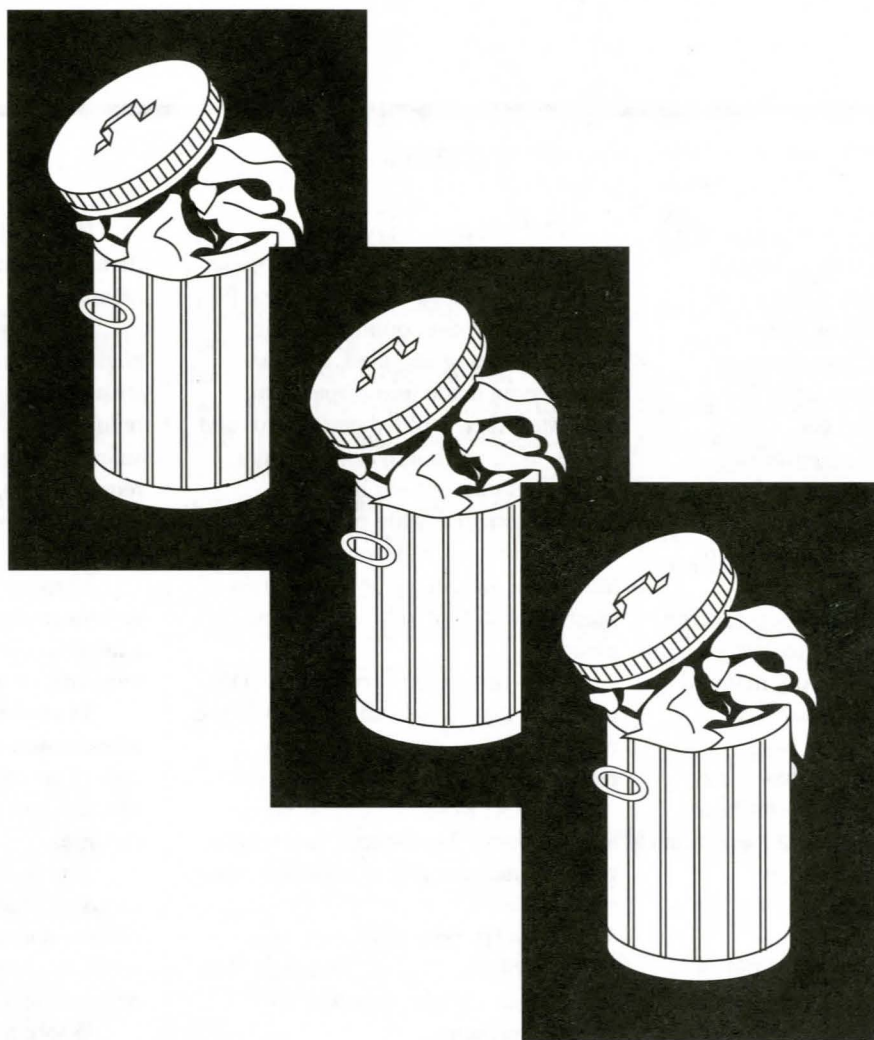
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Household Waste Management: Yours, Mine, and Ours

Year One

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Publication developed by Extension Specialists Shirley Niemeyer, Home Environment; Ann Ziebarth, Housing; Leon Rottmann, Human Development; and Extension Agents Judy Schwab, Deb Stevens, Monica Braun, Gerald Hopp, and Gary Hall.



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DEFINITIONS

Biodegradable: The property of a material that permits it to be broken down by microorganisms into simple, stable compounds such as carbon dioxide and water. Microorganisms secrete enzymes to chemically break down material that they eat.

Composting: The controlled degradation of organic material such as lawn clippings, kitchen scraps, leaves, and manure so as to decompose into fertile humus or mulch.

Decompose: To break down, come apart, change form, to rot, to decay.

Garbage or Trash: Any material considered worthless, unnecessary or offensive - usually thrown away.

Leachate: Liquid that has percolated through solid waste and/or been generated by solid waste decomposition and has extracted, dissolved, or suspended materials from garbage or soil in it.

Municipal solid waste (MSW): Wastes from households, commercial establishments, institutions, light industry, and small quantities of special wastes from hospitals and laboratories.

Open dump: Open unsanitary disposal sites used before sanitary landfills. Soon to be illegal.

Organic: From living organisms or any chemical compound containing carbon.

PET plastics: Polyethylene terephthalate plastics are used to make plastic bottles such as soda bottles. PET is one of the most common plastic containers being recycled, and currently being made into carpet yarn, polyester fiber, molded parts, films and sheets, skis, surfboards and sailboat hulls, furniture and car bumpers.

Photodegradable plastic: Process in which the sun's ultraviolet radiation attacks the link in the polymer chain of plastics causing it to break into smaller pieces.

Post-consumer scrap: Recyclable materials that have been products in the marketplace, as opposed to scrap reused within the manufacturing plant.

RCRA: Resource Conservation and Recovery Act. Federal law which governs management of all forms of solid waste.

Recycle: To collect, sort, and reprocess former waste for reuse either in the same form or as part of a different product.

Reduce: To decrease the amount of garbage generated by making thoughtful choices at purchase or through management thus reducing the volume of material that is discarded and minimizing toxic substances. Any waste management that reduces waste.

Reuse: To extend the life of an item by repairing or modifying it, or by creating new uses for it.

Sanitary landfill: A specially engineered and operated site for solid waste on land constructed so that it will reduce hazards to public health and safety. Certain design standards may require liners, leachate collection and monitoring systems, and methane gas controls.

Tipping fee: Cost per ton or unit volume to dispose of a load of waste at a landfill, transfer station, or for recycling or waste-to-energy.

Transfer station: Central location where waste is taken from smaller collection vehicles and placed in larger vehicles and then transferred to disposal facilities.

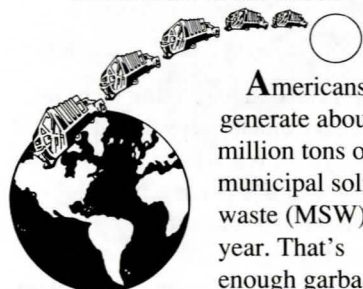
Waste-to-energy: Waste burned as received (mass burning) or processed to remove noncombustible materials to produce a more uniform fuel (refuse-derived fuel).

Waste Stream: The total flow of solid waste from homes, businesses, institutions and manufacturing plants that must be recycled, burned, or disposed of in landfills. Segments of the waste stream include the household or residential waste stream.

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Garbage - From Here to the Moon?



Americans generate about 160 million tons of municipal solid waste (MSW) per year. That's enough garbage to fill a convoy of trash trucks reaching half way from the earth to the moon. That much garbage equals about 1,300 pounds of waste per year for every person in the United States, or about 25 pounds per person per week.

Think about the waste discarded in your household. At about 25 pounds per person per week about how much garbage is discarded each week in your household? How much is discarded in your community each week?

According to Environmental Protection Agency (EPA) estimates every year Americans throw away 60 billion cans, 28 billion bottles, 4 million tons of plastic, 40 million tons of paper, 100 million tires and 3 million cars. In 1960, Americans generated more than 87 million tons of garbage per year or about 18.7 pounds per person per week. By the year 2000, if growth in disposal rates continue, Americans may generate 193 million tons of garbage per year.

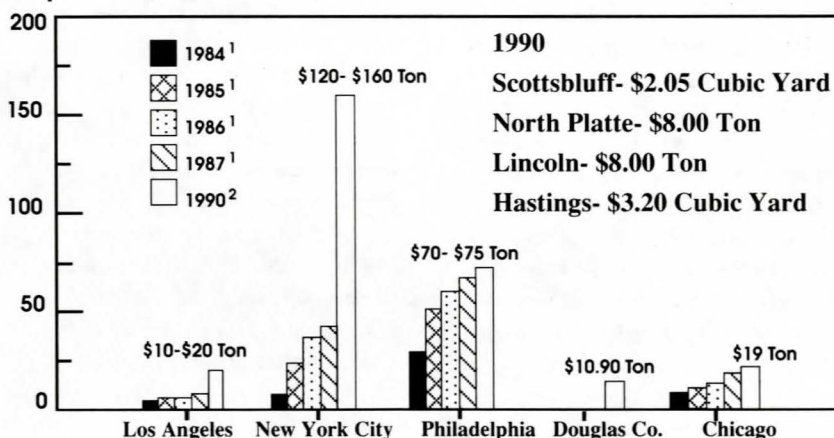
In 1989, the municipal solid waste was disposed of primarily by using a landfill (76%), and by waste-to-energy (13%) and recycling (11%). Landfills are closing faster than replacement facilities are opening either because they are full or because their design and operation do not meet current standards. By 1990, more than half of the cities in the U.S. were estimated to have exhausted their landfill capacity. By 1991, according to EPA, 45 percent of the approximately 6,000 landfills will be closed leaving just 3,300 sanitary landfills in operation. With fewer landfills and more difficulty in siting new landfills, tipping fees per ton of waste have increased. Average tipping fees per ton of waste increased from \$13.50 to \$20.00 between 1986 and 1987 or 67 percent, and prices are

predicted to increase as wastes from areas with little landfill space are shipped to other areas. In some areas of the U.S. tipping fees have increased to over \$160.00 per ton of waste.

In the future, sanitary landfills may be used more for disposal of non-recyclable items and the residue from processing items which are recyclable. Some states and cities have banned disposal of certain items in landfills such as car batteries, tires, white goods (appliances), and grass clippings. Over 100 waste-to-energy plants exist where household wastes are burned or processed to remove noncombustible waste to provide a more uniform fuel (refuse-derived fuel). Waste-to-energy facilities reduce the volume of garbage about 60 to 90 percent and generate steam or electricity.

Tipping Fees at Selected Landfills 1984-1990

Dollars per ton



¹Beyond the Crisis: Integrated Waste Management, Community Env. Council. (1987)

²Tipping Fees - The Ten Largest Metro Area, Solid Waste and Power (1990)

What's in Household Waste?



People generate more wastes and a wider variety of wastes than ever before. One solution to this problem is waste source reduction — create less trash. But,

what should be reduced? Should it be the waste that takes up the most space in a landfill? The waste that weighs the most? Products that do not decompose? Or, items which may pollute the water?

Before we go digging into recycling, reduction, and reuse further, let's first dig deeper into the garbage we have already made.

Getting to Garbage

"The Garbage Project"

How do we know that we are throwing away more waste than in the past? And, what we are throwing away? That is what "Le Project du Garbage" tried to find out. Researcher and anthropologist Dr. William Rathje at the University of Arizona has spent 13 years examining what people throw away and analyzing the contents of landfills.

What's in Household Waste?

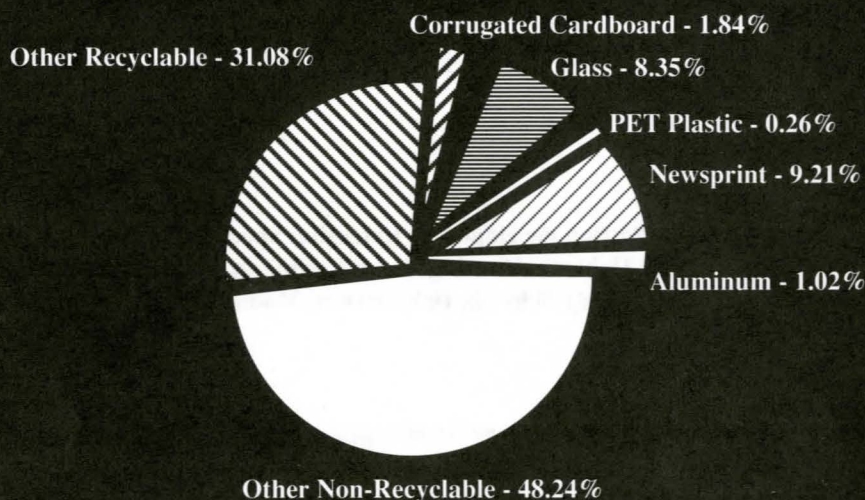
The Garbage Project studied fresh trash as it was discarded by households before being compacted in garbage trucks and landfills. A sample pick up involved all the garbage put out by a household on a pick up day for collection. The trash was sorted and measured.

By measuring samples from 846 households in Phoenix, Arizona, researchers found that the discarded household trash weighed an average of 39 pounds per household per pick up and filled a volume of 60 gallons.

About one-half of the average total weight (19.5 pounds) of the household trash and about two-thirds of the volume (63 percent or 38 gallons) of trash was made up of potentially recyclable materials. These materials included paper, cardboard, glass, some yard wastes, PET plastics, textile rags, aluminum, and other metals.

Composition of Residential Refuse

Percent by Weight
Phoenix, Arizona



Rathje, W., Wilson, D., Hughes, W. (1989). The Phoenix Recycling Project. University of Arizona.

What's in Community Landfills

Researchers actually dig through landfills to analyze waste contents by their weight and volume. Other studies have estimated landfill contents through analyzing what is in the waste stream or what is manufactured.

Based on Rathje's study of 99 core samples and 9,000 pounds of municipal solid waste taken from landfills in Illinois, California, and Arizona, here is what was found. The chart serves as a guide for composition of waste in landfills. However waste composition varies with type and size of community, climate, and time of year.

What Can Be Reduced?

One of the questions researchers like Rathje are trying to answer is what is in landfills and the waste stream that can be reduced? Plastics? Aluminum? Paper? Glass?

What does the public think is found in landfills? Some recent news stories have tagged the plastic microwave dinner tray as the obvious characteristic of the 1980s landfill; others have stated that styrofoam is straining the landfills, and still others label diapers as the problem. When people are asked what percentage of the

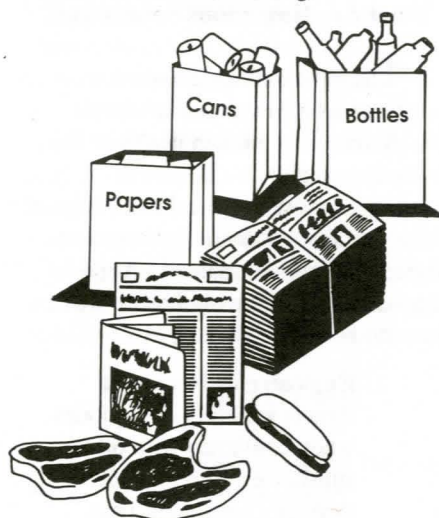
landfill fast-food packaging takes up, they often estimate between 20 and 30 percent. However, Rathje's digs found that less than one percent by weight and volume of each landfill was fast-food packaging.

Plastics are often seen as problems in landfills due to their high volume relative to their low weight. However, the Garbage Project found that plastic soda bottles and most other rigid plastic containers such as dish detergent containers were squashed. The majority of plastics by volume were plastic film bags such as cleaner bags, grocery bags, and garbage bags. Plastics accounted for about 12 to 18 percent of the volume of the landfills and about 7.3 percent by weight, although plastics are sometimes estimated by people as taking up 30 to 70 percent of the municipal solid waste.

Diapers are often estimated by people as taking up to 40 percent of the landfill. However the Garbage Project found less than one percent by weight and 1.5 percent by volume of landfills consist of diapers.

Newspapers are often underestimated in weight and volume of the landfills because the public sees them as recyclable or biodegradable. The Garbage Project found that newspapers made up about 14.4 percent by volume

of the landfills studied. Even though newspapers can be recycled, they represented the largest single item in landfills by both weight and volume. Recycling programs may have an effect on the amount of newspapers found in the landfill with volumes ranging from 10.5 percent to 16.2 percent although differences could also be due to purchasing behavior or other reasons. Since 1970, paper had increased in landfills and accounted for about 35.6 percent by weight and 38 percent by volume of the landfills dug.



Biodegradability: Reality or Myth?

Both the paper and plastic portions of residential solid waste seem to be increasing. The major rise in volume in the general paper category comes from packaging paper.

Organic materials are said to be biodegradable. Biodegradation is a process where microorganisms secrete enzymes to chemically break down material that they then use. There must be moisture present and other conditions must be met for biodegradation to occur. Most people assume that biodegradable materials decompose into methane and carbon dioxide rapidly, within a few weeks or months. Laws have been proposed in some states which would ban any packaging that does not decompose in one year.

The Garbage Project discovered that composting in landfills may not work because biodegradation may be a longer process than we thought. Food and yard wastes, in easily identifiable

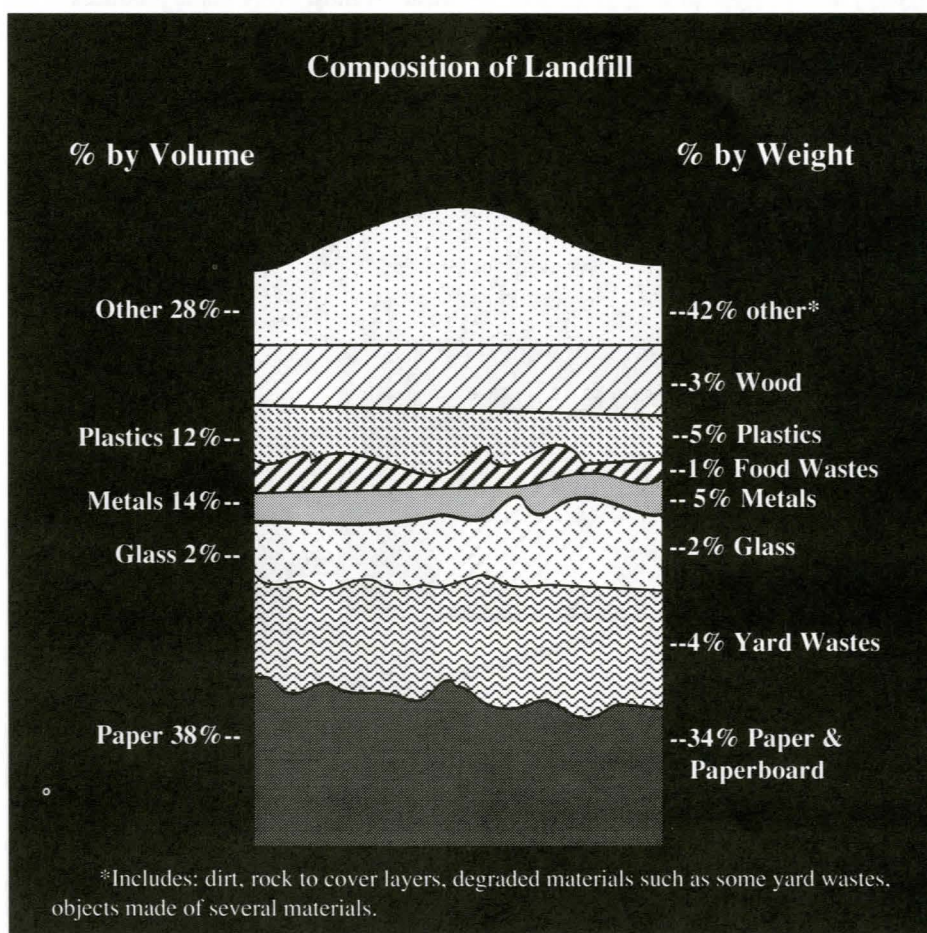
form, were found in the landfills studied even after being buried for years. Some organic decomposition seems to have occurred, but substantial quantities of all kinds of paper were also found, including brown paper grocery bags that supposedly would degrade in landfills in five weeks. The Garbage Project found no major changes in the percentage of paper found in the late 1970s garbage and the mid 1980s garbage. This indicates paper was not decomposing rapidly. Preservation of the paper occurred whether the papers were dry or saturated with water.

When the Garbage Project dug up trash that was deposited between 1970 and 1974, they found paper fractions in the same condition as the paper found in their 1977 to 1985 refuse. Organic debris such as grass clippings, a 1972 T-bone steak with lean and fat, and five hot dogs were preserved after 15 years in the landfill.

How Long Does It Take Wastes To Degrade?

Conditions are not ideal in landfills for biodegradation. Sunlight and moisture are usually not present. Some food does degrade, but at a very slow rate (about 50 percent every 20 years according to the Garbage Project). The remainder of the refuse in landfills seems to have fully retained its original weight, volume, and form even after 25 years according to Rathje digs.

Archaeologists are aware that organic items such as wood and paper might last for centuries under very dry, dark or very wet environments. Generally all the conditions needed for decay of organic materials by bacteria are not present in landfills. Bacteria growth is affected by moisture, light, oxygen, and heat. If these are not present in the amounts needed by specific types of bacteria, degradation does not occur.



Source: Rathje, W. (1989). Inside Landfills. Arizona Bureau of Applied Research and Anthropology, University of Arizona.

Does Household Waste in Landfills Create Environmental Problems?

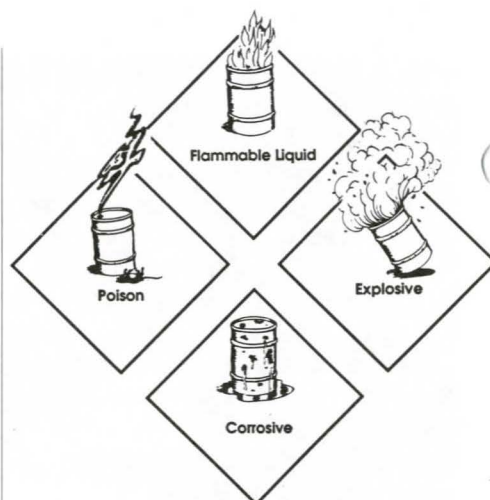
Contamination of ground water, surface water, soil, and air can sometimes be traced to improper disposal of household hazardous wastes. For example, soil samples taken from one landfill dig were compared by the Garbage Project to natural sediment in the area and state. Preliminary results showed that concentrations of lead, zinc, cadmium, and mercury may be higher in landfills than in the natural soils surrounding the site. This suggests potential damage to the environment or human health by household hazardous waste is unclear and needs further study.

Some community landfills and open dumps have raised concern about the environment. In 1989, the Nebraska Department of Environmental Control sampled ground water from five open dump sites and found that ground water degradation occurred at all five sites. Three of the sites showed major degradation of ground water quality. Contaminated water was unsuitable for drinking and posed a health risk to humans and livestock.

At all five sites an increase in heavy metals was noted. One site had well samples with a pH of 11.99 which is caustic (a pH of 12.5 is characteristic of hazardous waste). These sites showed the presence of volatile organic compounds which are primarily man-made solvents, and the levels were above the maximum regulatory contaminant levels. However, these were initial tests and do not make up a comprehensive assessment of the ground water at these five sites.

Are Some Household Wastes Hazardous?

Studies by the Garbage Project have found household products a possible source of hazardous materials in landfills. Studies show that although household hazardous wastes are a small part of the total residential solid waste (less than one percent), total amounts generated per year are high. Each household annually disposes of about five and one-half pounds of hazardous waste. Almost every home produces waste that poses hazards if improperly disposed. Most household hazardous waste falls into the household maintenance category.



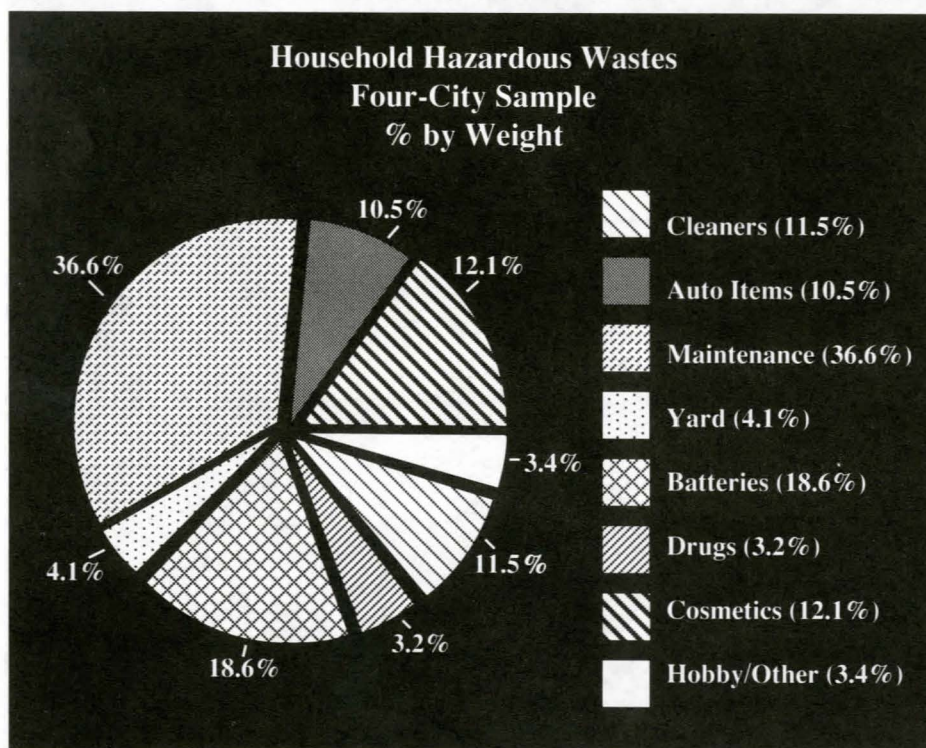
What Are Hazardous Substances?

The EPA defines a hazardous substance as a dangerous substance which may harm human health or the environment and as a discarded substance whose chemical or biological nature makes it potentially dangerous to people. The EPA named several characteristics that would make waste hazardous:

- 1. Explosive or Reactive:** Reacts violently or explodes when combined with other substances. Can explode through exposure to heat, sudden shock, or pressure.
- 2. Corrosive:** Eats away substances - can burn and destroy living tissue. For example, strong acids such as in auto batteries or strong alkali products such as lye.
- 3. Toxic:** Capable of causing injury or death. Some toxic substances are known to cause cancer.
- 4. Ignitable/Flammable:** Can be easily set on fire or ignited.

The EPA was required to compile a list of particularly hazardous substances which included more than 200 substances by 1985. Although household wastes are exempt by definition from federal hazardous waste regulations, the EPA has stressed that household hazardous waste should be treated with caution.

According to the Resource Conservation and Recovery Act, the term "hazardous" waste for purposes of regulation does not apply to normal



Source: *The Garbage Project*, University of Arizona. Rathje, W., Wilson, D. Hughes, W. (1987)

household quantities. Household hazardous wastes tend to be small amounts. Some hazardous products used by business and industry are not available to the average household.

When Is A Product Hazardous?

If used according to label directions, most household products are not hazardous. However, some become hazardous if used, stored, or disposed of improperly. IMPROPER USE may also cause toxic health effects. IMPROPER STORAGE may allow chemicals to leak into the environment causing dangerous chemical reactions, toxic health effects, or environmental pollution. IMPROPER DISPOSAL may allow chemicals to enter directly into the environment through waterways or ground water. The Garbage Project also reports that little is known about the effects of burning of household hazardous wastes.

What's In It For Me?

What are the Effects on my Health and Well-Being?

Within current farm practices, crop protection chemicals are essential for the production of abundant, high quality food, feed, and fiber. The Food and Drug Administration annually confirms that pesticides are not a health concern in our food. Yet, used incorrectly, they can leach or run off into water supplies. There is evidence that some of this has occurred in the past, especially where there were highly erodible land, vulnerable water supplies, and/or errors in judgment.

In addition to the potential problem of ground water contamination, health professionals highlight possible rodent problems in the management of solid waste areas there is also a great need for safe disposal of selected medical waste and radio-active materials.

Hazardous waste disposal problems can be viewed in terms of past practices and future options. Today's laws provide a framework for developing improved waste disposal techniques. However, inadequacies in the regulations implementing these laws

result in our achieving far less progress than might have been accomplished.

Some existing hazardous waste disposal sites pose a current danger to human health and the environment. Other dump sites exist that have not yet been investigated; therefore, the size of the problems they may pose remains unknown. Science is in its infancy in its ability to evaluate the health and environmental impacts resulting from past improper hazardous waste disposal practices. Uncertainty exists about the methods that can be used to clean up problem sites. Excavation and removal of wastes and on-site containment are both options that need to be studied in much greater detail.

In general, the potential negative effects of household wastes on human health arise from:

- 1) inadequate sanitation inside and outside homes;
- 2) infestations of rodents and insects where wastes accumulate;
- 3) disease organisms transmitted by insects that flourish in waste accumulations; and,
- 4) infections and infestations transmissible to humans for which household pets are primary or intermediate hosts.

The solutions to these situations consist primarily of cleaning up, sanitizing, isolating wastes, and keeping them separate from humans and domestic pets.

Potential negative effects on human health can arise from improper handling and storage of potentially hazardous materials used for:

- 1) household operations;
- 2) health care (eg. medicines);
- 3) yard care;
- 4) maintenance of the home, household equipment, automobiles, and recreation equipment, and
- 5) hobbies, and recreational, vocational/avocational. Knowing what substances are hazardous, isolating, storing, and handling such substances safely, and disposing of excess or outdated supplies using acceptable procedures are the solutions.

Detrimental effects on human health may also come from air or water contamination when individual or corporate disposal of toxic substances occurs. Solutions to these situations are found in containing the contaminants, cleanup and monitoring of existing problem situations; and most of all--vigilance in monitoring individual and group actions which create problem situations.

The challenge to each one of us is clear. We must evaluate the environmental and public health impact of improper waste management practices, ensure that future disposal does not threaten health and the environment, and, ultimately, reduce hazardous wastes by changing manufacturing processes and the choice of chemicals we use.

We Need To Know More...

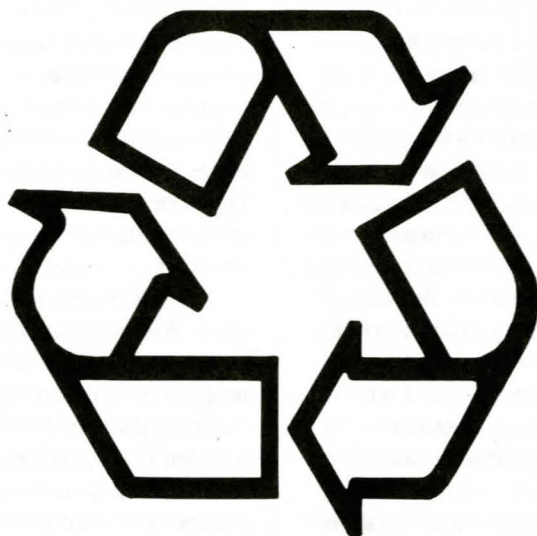
We do not know exactly how each product will react in the landfill or our environment in 50 or 100 years. Some products have not been around long enough to know their long term effects. But, with more research, we will know more. Until then, we can take steps based on the evidence available to date, and by being responsible consumers and users of products.

If you are uncertain how to dispose of some products, information is available from various public agencies and associations. Sometimes there are few or no alternatives for disposal. Co-operating consumers, communities, industry and businesses could lead to solutions.

The product manufacturer, Cooperative Extension, state or local Department of Health, or the Department of Environmental Control, Nebraska State Recycling Association, your local fire department or the State Fire Marshal's Office may be able to answer questions about how to dispose of some products.

Reduce, Recycle, Reuse

Waste management refers to practices to safely and effectively handle the household waste stream. A waste management system will include:



Reduce, Reuse, Recycle

- **Source reduction:** People have choices and can reduce the volume of garbage they generate by making thoughtful choices when they buy products. Provide your own reusable grocery bags, use both sides of paper, purchase products with reduced packaging when safe to do, buy products in recyclable packaging — products made from post-consumer wastes, repair existing items if the repairs are more environmentally sound, or do not purchase the product if the item is not needed. The use of non-toxic substances when possible.

- **Reuse of products:** Renew the life of an object by redefining its purpose and using it again. Extend the life of an item by repair or modification or create new uses for items within the household.

- **Recycling:** This is the collection and reprocessing of manufactured materials for reuse either in the same form or as part of a different product. Collecting, and separating products, preparing them to buyers' specifications, sale to markets, processing, and eventual reuse of materials are part of the recycling loop.

- **Using landfills and waste combustion/energy recovery:** Manage wastes which cannot be recycled, reused, or reduced.

Estimates vary regarding the resources saved by recycling. The Solid Waste Handbook suggests that each ton of paper recycled saves 17 (8" diameter) trees and 390 gallons of oil. It produces 74 percent less air pollution and 35 percent less water pollution than production of paper from virgin fibers. Recycling aluminum is estimated to use 95 percent less energy than making it from raw bauxite ore and creates 95 percent less air pollution and 97 percent less water pollution. Recycling glass saves 32 percent of the energy, and produces 20 percent less air pollution than manufacturing new glass.

Although some recycled product markets fluctuate, finding a market for products before collection for recycling is important. If there are viable and stable markets for used materials such as glass, aluminum, paper, steel, plastics, tires, and used oil, recycling can divert these items from the waste stream. Consumer demand, purchase and use is important in recycling and in creating demand for recycled or post-consumer waste products.

Product labeling varies. Products made from a percentage of waste that has been in the consumers' hands may be labeled "Post-Consumer Recycled." "Recycled" products may mean the

product has been in the consumers' hands at one time or that the materials contained in the product are made in part from trimmings or wastes during the manufacturing process. "Recyclable" means that a market for the material exists someplace.

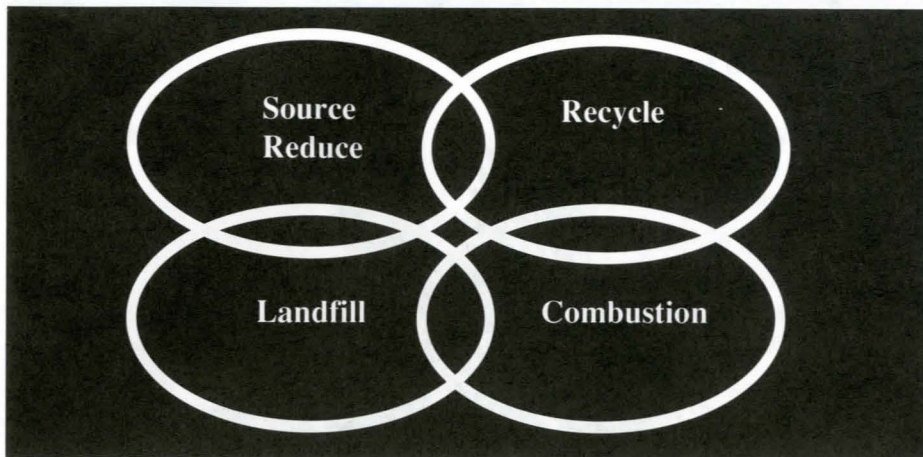
People who do not recycle say they lack information on how to carry out recycling activities. An increase in recycling behavior seems to occur when people know how and where to recycle items and what items can be recycled. Householders often report lack of information, lack of room to store the items, recycling being too much of a hassle or mess, and lack of recycling facilities. Making recycling seem less of a hassle will encourage more households to participate.

Consumers can contact local recycling associations or volunteer organizations, city or county officials, sanitary professionals, extension offices, the Nebraska State Recycling Association, the Nebraska Department of Environmental Control, people already recycling items, or write product manufacturers for leads on where to recycle items in their area.

In addition to recycling, composting yard waste (grass, leaves, and brush) can save landfill space and create soil additives or mulch. Yard waste made up about 6 percent by volume of 1985-1986 total MSW in landfills. Another option is not to collect the grass clippings at all. Several states and cities have banned yard waste from landfills. Home composting must be carefully controlled because piles can breed bacteria and attract rodents.

Effective waste management requires an integrated approach - the combination of reducing, recycling, composting, sanitary landfill and waste-to-energy. Using the integrated approach does not mean all these options are implemented, but presents options for individuals and communities to consider.

The EPA prefers source reduction and recycling for reducing waste. Recycling (including composting) reduces the potential risk to the environment, diverts waste from landfills, and slows the depletion of natural resources.



You and Your Community

Finding effective ways to manage solid waste is a problem for local officials, urban planners, environmentalists, as well as community residents. Solving the issue will take the help and cooperation of everyone involved from educators to consumers, engineers to officials, waste haulers to landfill operators, rural residents to urban residents, and more. Many of the alternatives available to communities are influenced by forces outside the local area. The market for recycled products as well as the supply of materials to be recycled can affect the benefits and costs a community may face when considering the establishment of a recycling facility. State and federal regulations also determine some of the options available.

The Environmental Protection Agency has set a goal of 25 percent reduction by 1992 in wastes going to landfills. In addition to facing tougher landfill regulations, an increased concern for ground water protection has led some communities to close their landfills. But, simply closing the dump may not eliminate problems. Issues such as community liability for existing or closed dumps and finding alternative places to dispose of solid waste remain.

Nebraska has 544 communities, many of which are faced with inadequate facilities for solid waste management. In mid-1990 over 210 municipalities with open unlicensed or unregulated dump sites had been identified. Earlier EPA regulations required that by November 1987 hazardous waste and small quantities of non-

restricted chemicals were to be disposed of in licensed facilities. In 1990 Nebraska had only 40 licensed solid waste disposal sites. Under state law, Nebraska communities of 5,000 or less are exempt from regulations licensing their landfills. While this exemption provides for more reasonable local control and management there is concern about public safety. Of the active open dump sites approximately 10 percent are within 500 feet of a private water supply and nearly 16 percent are 5 feet or less to ground water. Unless landfill design and management is carefully handled, the potential contamination problems for local drinking water is apparent.

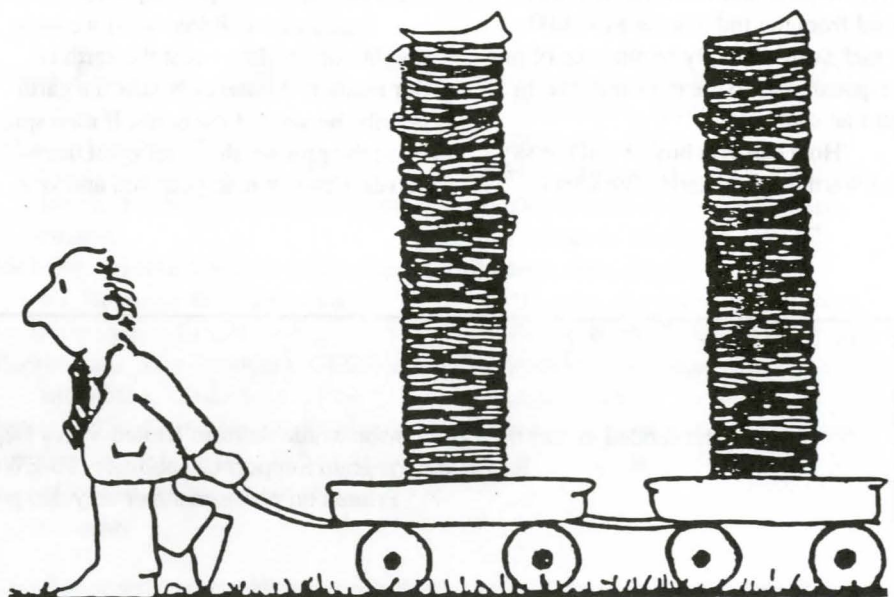
In the last few years Nebraska legislation has included laws to encourage and support waste minimization,

waste management, recycling, and waste exchange. A phase-in of requirements that plastic items (such as diapers and grocery bags) be biodegradable is one example. And, while the research on the biodegradability of "cornstarch in plastic" is still being conducted and the issue is not yet resolved, this legislation indicates the concern for the environment by Nebraskans.

There are over 260 recycling firms or centers in Nebraska. Unfortunately, these firms are not organized as a network and have few identified markets for their "product". As a result, there is confusion among consumers about materials which can be handled by each firm.

The lack of clearly identified markets for recycled products results in considerable price variation as well as making it a difficult business to manage. A listing of recycling centers and products they accept is available from the Nebraska Department of Environmental Control, and the Nebraska State Recycling Association (800-248-7328).

Federal regulations are being implemented regarding wellhead protection areas for public water supplies. These regulations protect the area surrounding a well to minimize potential pollution from run-off. Wells located near landfills may be particularly susceptible to pollution.



What Can You Do?

- (1) Handle household waste and household hazardous waste responsibly.
- (2) Become informed. Find out all you can about the local solid waste issues in your community and examine several viewpoints. Is your local land-fill licensed? Where does your garbage go? What other options exist?
- (3) Search out information about products you use every day and stay abreast of recent research. For example, there is considerable debate about the true biodegradability of plastics. Learn the recycling symbols and consider the amount of packaging used in the products you purchase. Think before you buy. Thoughtful purchases can reduce future solid waste.
- (4) Consider the effect that your own solid waste management could have on the quality of our drinking water. Are you using your own property for solid waste disposal? Evaluate the location of existing garbage sites in terms of potential ground water quality effects. A map identifying the garbage site and location of nearby wells might be one way to begin evaluating this potential problem.

In summary, a few words of wisdom.

In 1851, Seattle, chief of the Suquamish and other tribes around Washington's Puget Sound responded to a treaty offer by the U. S. government to purchase 2 million acres of land from the Indians for \$150,000. Chief Seattle's reply reminds us of our responsibility to the environment. In part he said:

"How can you buy or sell the sky, the warmth of the land. The idea is



strange to us. If we do not own the freshness of the air and the sparkle of the water, how can you buy them?

Teach your children what we have taught our children - that the earth is our mother. Whatever befalls the earth befalls the sons of the earth. If men spit upon the ground, they spit upon themselves. Contaminate your bed and you

will one night suffocate in your own waste.

Where is the thicket? Gone. Where is the eagle? Gone. The end of living and the beginning of survival."

If we do not take care of our earth, she cannot take care of us. Each and every one of us has a responsibility and we must take it seriously.

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Printed on post-consumer recycled paper.

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