State of California

Little Hoover Commission

1303 J Street, Suite 270 • Sacramento, CA 95814 • (916) 445-2125

REPORT ON SOLID WASTE MANAGEMENT: THE TRASHING OF CALIFORNIA

JULY 1989

Commission on California State Government Organization & Economy

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July 5, 1989

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The Honorable David Roberti
President pro Tempore of the Senate
and Members of the Senate

The Honorable Willie L. Brown, Jr.
Speaker of the Assembly
and Members of the Assembly

The Honorable Kenneth L. Maddy
Senate Minority Floor Leader

The Honorable Ross Johnson
Assembly Minority Floor Leader

Dear Governor and Members of the Legislature:

Is California in a garbage crisis? Fifteen counties, including Los Angeles, will run out of landfill space in less than eight years. The entire State will exceed its existing landfill capacity by the year 2000. To magnify these problems, the citizens of the State do not want waste disposal facilities developed near them. Is California in a garbage crisis? Not yet, but if the State does not receive the necessary leadership from state government, alter its course from relying on landfills and aggressively pursue alternative disposal technologies, California will not be able avert such a crisis.

The Little Hoover Commission has completed its report on solid waste management in California. Initiated in September 1988, the study was designed to identify issues related to solid waste generation and disposal, to determine the role of government in developing policies and systems to manage solid waste, to evaluate the success of traditional policies of solid waste management and to identify alternatives, if necessary.

The Commission's report finds that, despite state law which outlines an effective policy of solid waste management, California continues to rely on landfills to get rid of its garbage. This is because, in part, California's lead agency responsible for solid waste management policies

has emphasized landfilling in past years and there has been little pressure to develop disposal alternatives, including recycling. In fact, because of a lack of leadership, the State has not even developed a comprehensive recycling program.

Because we have followed a dead-end path of disposal technology, we are generating more garbage than our landfill space can accommodate. Other effects of the State's reliance on landfills is the exposure of some Californians to health dangers and threats to the environment. Several studies have shown that some landfills cause groundwater and surface water contamination, methane gas migration, and an assortment of problems ranging from unpleasant odors and vector problems to noise and traffic problems. Finally, California's reliance on landfills will result in long-run costs stemming from the unnecessary depletion of natural resources and the skyrocketing prices of dumping garbage in landfills as they become increasingly scarce.

Another finding in the Commission's report addresses the effectiveness of the California Waste Management Board. Although it is the lead agency for managing the State's solid waste, the Board has failed to meet its responsibilities to encourage integrated waste management and discourage the use of landfills. The Board appears to have moved in the right direction recently, but it is still hindered by the public's attitude toward solid waste and the common perception that the Board caters to the whims of waste haulers. As a result, California lacks a lead agency that can effectively address the State's current solid waste problems.

To address the findings in the report, the Commission's recommendations include the following:

1. A statewide program that explicitly contains source reduction as the first priority, recycling and composting as the second priority, incineration as the third priority, and landfill disposal as the last priority should be established.

2. Counties should be required to establish solid waste programs that institute systems for collecting garbage fees on a "per can" basis.

3. Local governments should be required to prepare, adopt and implement plans that would divert from landfills through source reduction and recycling 25 percent of the waste generated within the jurisdiction of the local agencies.

4. The State's lead agency for solid waste management should conduct a study to determine the costs avoided by increasing recycling. The study should include the effect of mandatory purchasing of recycled materials by state and local governments and a system of tax credit incentives, both which, if consistent with the study, should be instituted.

5. Control and composition of the State's lead agency should be modified to ensure its independence and credibility.

The Commission believes that the implementation of these recommendations will help California pursue rational courses of action in managing its solid waste and avert an impending garbage crisis.

Respectfully,

NATHAN SHAPELL, Chairman
Haig Mardikian, Vice Chairman
Senator Alfred Alquist
Mary Anne Chalker
Albert Gersten
Richard Gulbranson
Senator Milton Marks
Assemblywoman Gwen Moore
George Paras
Abraham Spiegel
Barbara Stone
Richard Terzian
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EXECUTIVE SUMMARY

At an annual rate of over 2,700 pounds, Californians generate more trash per person than anyone else in the world. Each year, the entire State disposes of between 38 million and 40 million tons of solid waste. This amount is roughly 24 percent of the nation's total, even though California has only about 10 percent of the nation's population.

Solid waste is composed of a variety of typical items found in most garbage cans. Paper and paper products generally comprise the largest portion, followed by yard waste, food waste, glass, plastics, metals, rubber, leather, textiles, wood and miscellaneous inorganic waste.

There are four basic methods for disposing of or reducing solid waste: burying in landfills; burning in incineration facilities; recycling, including composting; and providing incentives or disincentives to diminish the volume of waste generated (source reduction). Each of these methods plays a valuable role in an integrated system of managing solid waste. In such a system, the various methods complement each other to safely and effectively handle garbage.

In September 1988, the Commission on California State Government Organization and Economy (also known as the Little Hoover Commission) began its study of solid waste management in California. The Commission identified the major issues related to solid waste generation and disposal, determined the role of state and local governments in developing policies and systems to manage solid waste, and evaluated the success of traditional policies of solid waste management and identified potential alternatives. The Commission's study resulted in the following findings:

1. California Lacks An Integrated System for Managing Its Solid Waste

Although state law outlines an effective policy of solid waste management which requires that the State employ various methods of waste disposal, California continues to rely on landfills to get rid of its garbage. Landfills continue to be the State's primary method of disposal because California's lead agency responsible for solid waste management policies has emphasized landfilling in past years and there has been little pressure to develop disposal alternatives. As a result, the State is generating more garbage than its landfill space can accommodate. For example, 15 counties are projected to exceed their landfill capacity by the end of 1996, and the entire State is expected to run out of landfill space by the turn of the century. Additional landfill space is difficult to develop because Californians do not want waste disposal facilities

developed near them. Other effects of the State's reliance on landfills is the exposure of some Californians to health dangers and threats to the environment in some areas. Several studies have shown some landfills to be the cause of groundwater and surface water contamination, methane gas migration, and an assortment of problems ranging from unpleasant odors and vector problems to noise and traffic problems. Finally, California's reliance on landfills will result in long-run financial costs stemming from the unnecessary depletion of natural resources and the skyrocketing prices of dumping garbage in landfills that are becoming increasingly scarce.

2. The State Lacks A Comprehensive Statewide Recycling Program

Supporting the rationale behind integrated waste management, state law and the concepts of conservation demand that recycling be a major part of California's system of handling garbage. However, because of a lack of leadership, the State has not developed a comprehensive recycling program. As a result, valuable resources are depleted unnecessarily and California continues to rely heavily on landfills as its primary method of waste disposal.

3. The California Waste Management Board Has Been Ineffective

Although it is the lead agency for managing the State's solid waste, the California Waste Management Board (CWMB) has failed to meet its responsibilities to encourage integrated waste management and discourage the use of landfills. Recent efforts by the CWMB have been more supportive of its statutory objectives, but the CWMB's effectiveness is still hindered by the public's attitude toward solid waste and the common perception that the CWMB is not independent of certain interests in the waste industry. As a result, California lacks a lead agency that can effectively address the State's current solid waste problems.

In addressing these findings related to the management of solid waste in California, the Commission's report presents five recommendations:

1. The Governor and the Legislature should enact legislation that explicitly establishes a statewide program that is based on a hierarchy in which source reduction is the first priority, recycling and composting are the second priority, environmentally safe incineration is the third priority, and environmentally safe landfill disposal is the fourth and last priority.

2. The Governor and the Legislature should require counties to establish solid waste programs that institute, where possible, systems for collecting garbage fees on a "per can" or "per bag" basis, and garbage collection billing systems

that segregate garbage fees from fees for other county billings. Further, the State's lead agency on solid waste management should establish an aggressive education campaign aimed at teaching consumers the values of conservation and efficient use of resources.

3. The Governor and the Legislature should enact legislation that requires local governments to prepare, adopt and implement plans that would divert from landfills through source reduction and recycling 25 percent of the waste generated within the jurisdiction of the local agencies. Further, the local plans should also attempt to specifically divert household hazardous wastes from landfills. Finally, the legislation should allow the local agencies to impose fees on the generators of waste to pay the costs of preparing, adopting and implementing the plans. These fees should include, but not be limited to, fees based on the amount of waste disposed of in landfills.

4. The State's lead agency for solid waste management should conduct a study to determine the costs avoided by increasing recycling. The study should also show how recycling can be increased through mandating the purchase of recycled materials by state and local governments and through the incentive of state tax credits. If consistent with the study, the Governor and the Legislature should enact legislation requiring state and local governments to purchase specified amounts of various recycled products. Further, the legislation should provide for tax credits equal to a specified percentage of the amount paid for recyclable materials generated in California, and tax credits associated with the purchase price of qualified machinery or equipment used to manufacture finished products composed of a specified amount of waste material.

5. The Governor and the Legislature should enact legislation that requires the State's lead agency to exist as an independent five-member board. The board should consist of members who have specified expertise related to managing solid waste. Further, the board should be subject to certain controls related to conflict of interest.

INTRODUCTION

In 1987, the wandering garbage barge from Islip, New York gained national media attention as it searched for a location in which it could dispose of its 3,186-ton load of municipal solid waste.

For six months in 1988, the Board of Supervisors in Contra Costa County was deadlocked over selecting a site for a new landfill facility in which solid waste could be disposed of. The deadlock caused the Board to offer four sites on four separate ballot initiatives in the county's general election. Each, however, was defeated by the voters.

Currently, New York City's landfill is a 3000-acre dump on Staten Island ironically named Fresh Kills. It is a source of problems ranging from foul odors, sea gulls and rats to seepage into local waterways. By the year 2005, Fresh Kills will be the highest point on the eastern seaboard south of Maine; it will stand 505 feet above New York Harbor, or 200 feet higher than the Statue of Liberty. A national magazine article recently stated that the mountain of garbage " is likely to become one of the wonders of the world -- an ugly, stinking symbol of urban civilization."[1]

These striking examples underscore the serious problems that confront state and local governments in their attempts to manage ever-increasing amounts of municipal solid waste. Traditional methods of disposing of garbage are being questioned for their efficiency, effectiveness and adverse effects on the environment. Further, issues have been raised regarding who should be responsible for developing statewide policies related to solid waste management.

Background

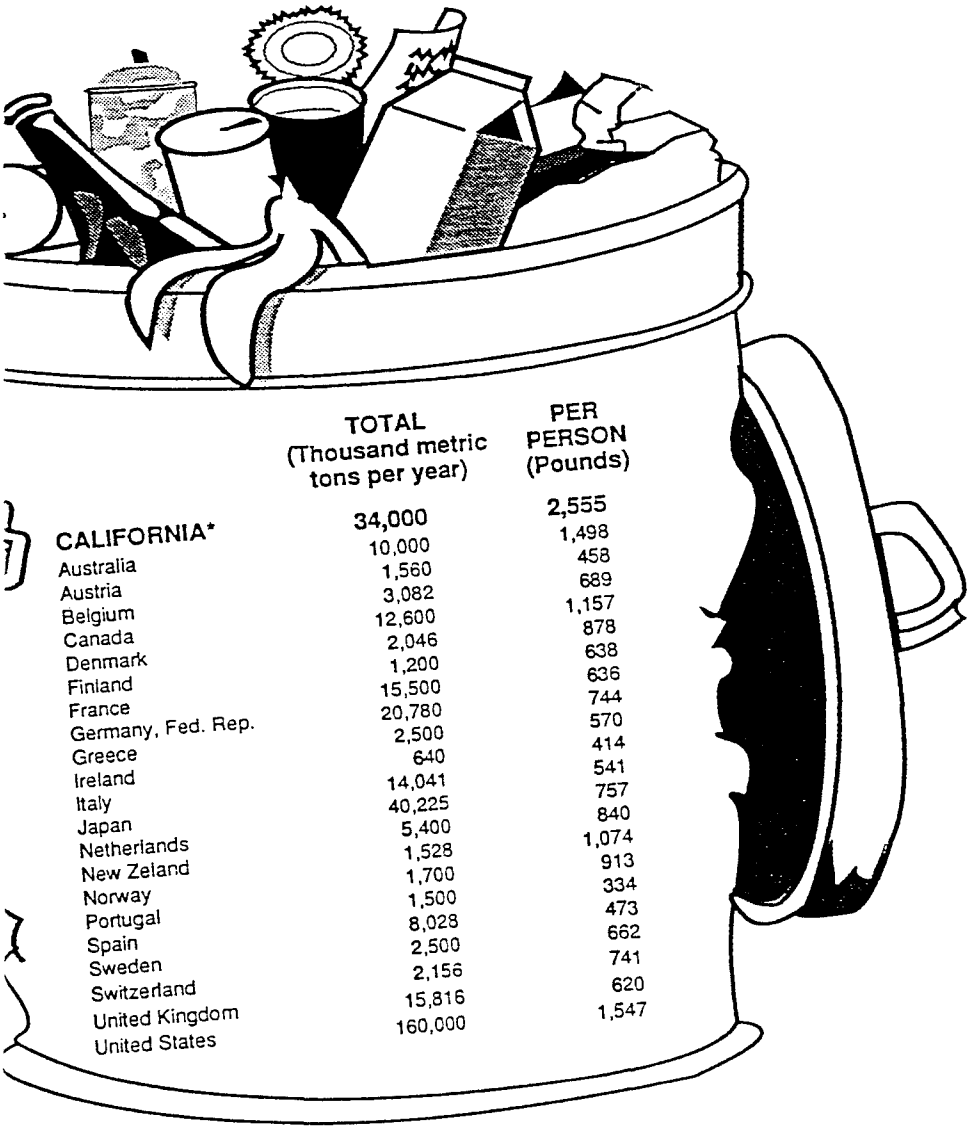
Californians generate between 38 and 40 million tons of non-toxic solid waste each year.[2] Although the State has only about 10 percent of the nation's population, it generates roughly 24 percent[3] of the nation's solid waste. On the average, each Californian disposed of over 2,700 pounds of garbage in 1988, or over 7 pounds per person each day; this amount is nearly twice the national average. Approximately 60 percent of the waste comes from individuals; the remaining 40 percent is generated by commercial or industrial sources.[4]

The California Assembly Office of Research's April 1988 report, Integrated Solid Waste Management: Putting A Lid on Garbage Overload, indicates that California is the most wasteful society in the world. Figure 1, taken from that report, compares California with several other countries to provide an example of the State's "garbage producing prowess." Few of the countries

l generate waste on a per-person basis at even
ibited by Californians.

Figure 1

California vs. World Garbage



	TOTAL (Thousand metric tons per year)	PER PERSON (Pounds)
CALIFORNIA*	34,000	2,555
Australia	10,000	1,498
Austria	1,560	458
Belgium	3,082	689
Canada	12,600	1,157
Denmark	2,046	878
Finland	1,200	638
France	15,500	636
Germany, Fed. Rep.	20,780	744
Greece	2,500	570
Ireland	640	414
Italy	14,041	541
Japan	40,225	757
Netherlands	5,400	840
New Zeland	1,528	1,074
Norway	1,700	913
Portugal	1,500	334
Spain	8,028	473
Sweden	2,500	662
Switzerland	2,156	741
United Kingdom	15,816	620
United States	160,000	1,547

rld Resources, 1987.
t for California, all figures represent average annual municipal waste generation in1980.
figures were calculated from data provided by the California Waste Management Board.

California's volume of solid waste is expected to increase. Present estimates are that the statewide annual total will increase from nearly 40 million tons in 1988 to over 45 million tons by the turn of the century.[5] This increase is consistent with national projections, which expect waste generation to rise from about 160 million tons per year to 193 million tons by the year 2000.[6] These increases are not only absolute increases, they also represent an increase in the amount of waste disposed of per person. For example, in 1960, Americans generated waste at a rate of 2.65 pounds per person per day; by 1986, that figure had jumped to 3.58 pounds, and the trend is expected to continue into the next century.[7]

There are four basic methods for disposing of or reducing solid waste: landfilling; incineration; recycling, including composting; and source reduction.

Landfilling, the most widely used method of solid waste disposal, is basically a matter of burying garbage in large holes in the ground and covering the garbage with dirt. The landfills generally are equipped with a leachate system designed to siphon away and trap the liquids that accumulate in the landfills. Some landfills, particularly those most recently developed, have liners that are designed to prevent any filtering of liquids into the soil that surrounds the landfill. Landfills can be designed to recover methane gas, which is naturally produced by the decomposition of organic matter in landfills, converted to electricity and sold to public utilities. If a landfill is set up to recover its methane gas, it can be considered a waste-to-energy facility.

Incineration or burning facilities are either "mass burn" facilities or "refuse-derived fuel" facilities. Mass burn facilities consume a heterogenous mixture of unprocessed solid waste. Fundamentally, the operation of a mass burn facility involves burning in an incinerator all of the refuse that is transported to the facility, and then generating heat, steam and electricity. Refuse-derived facilities are designed to presort and reformulate refuse prior to its incineration and subsequent energy generation. Both types of facilities can be considered "waste-to-energy" projects because of their capabilities of converting into steam and electricity the heat generated by burning the waste.

Recycling is a means by which discarded materials are reused, either in their original form or after alteration. For example, bottles can be reused after being kept intact and sanitized or after being crushed, melted and re-formed. In addition to glass, other materials that can be recycled include paper products, aluminum products and some plastic products.

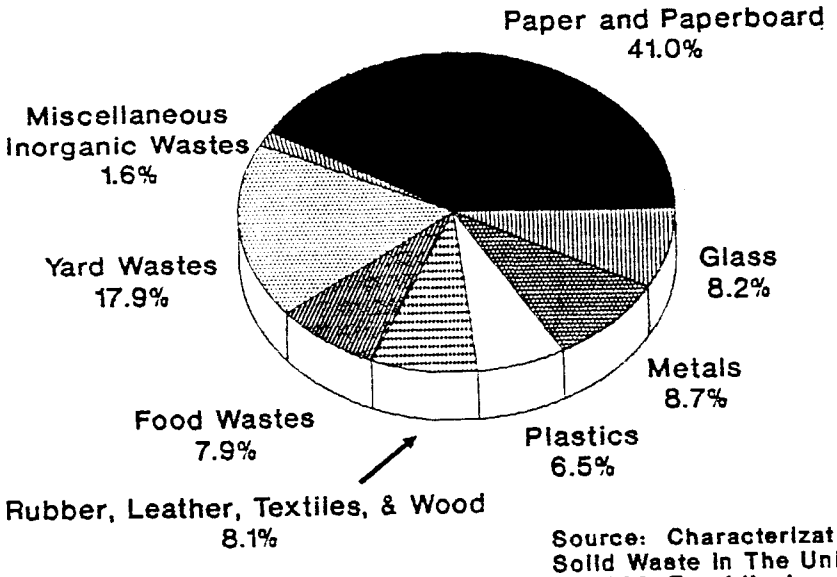
Composting, also considered a form of recycling, is a method of producing an organic fertilizer that is created from natural waste products. The fertilizer, compost, is produced when organic wastes such as grass and garden clippings are ground and placed in piles, ideally under controlled temperature and moisture conditions.

Source reduction reduces waste by diminishing the volume of waste materials generated at the source. Two examples are the establishment of packaging requirements that minimize superfluous wrappings on consumer products and the provision of economic incentives to manufacturers thus minimizing waste products generated in the manufacturing process.

The composition of municipal solid waste can be categorized in several different ways. The United States Environmental Protection Agency (EPA) identifies eight categories of solid waste. As Figure 2 indicates, 41.0 percent of the waste stream consists of paper and paper products, and yard wastes comprise 17.9 percent of the solid waste generated by Americans. The remaining garbage is categorized into: metals (8.7 percent); glass (8.2 percent); rubber, leather, textiles, wood (8.1 percent); food wastes (7.9 percent); plastics (6.5 percent); and miscellaneous inorganic wastes (1.6 percent).[8] A negligible amount of other waste not categorized by the EPA represents only 0.1 percent of the waste stream and does not appear in Figure 2.

FIGURE 2

GROSS DISCARDS OF MUNICIPAL SOLID WASTE MATERIALS, 1986



Source: Characterization of Municipal Solid Waste in The United States, 1960 to 2000; Franklin Associates, 3/30/88

The composition of California's solid waste stream is somewhat similar to the national figures. The composition of the State's waste stream, based on a study of several Northern California communities, is described in Table 1.

TABLE 1

COMPOSITION OF MUNICIPAL WASTE
IN SEVERAL CALIFORNIA COMMUNITIES

Category	Composition (Percent by Weight)
Mixed paper	28.1
Newsprint	11.3
Corrugated	5.0
Total paper	44.4
Plastic	6.0
Yard waste	14.4
Wood	0.8
Food waste	11.0
Rubber and leather	0.6
Other combustible	5.0
Ferrous metals	3.2
Aluminum and nonferrous metals	1.4
Glass	9.5
Other (noncombustible)	3.4
Salvageable	0.2
Total	100.0

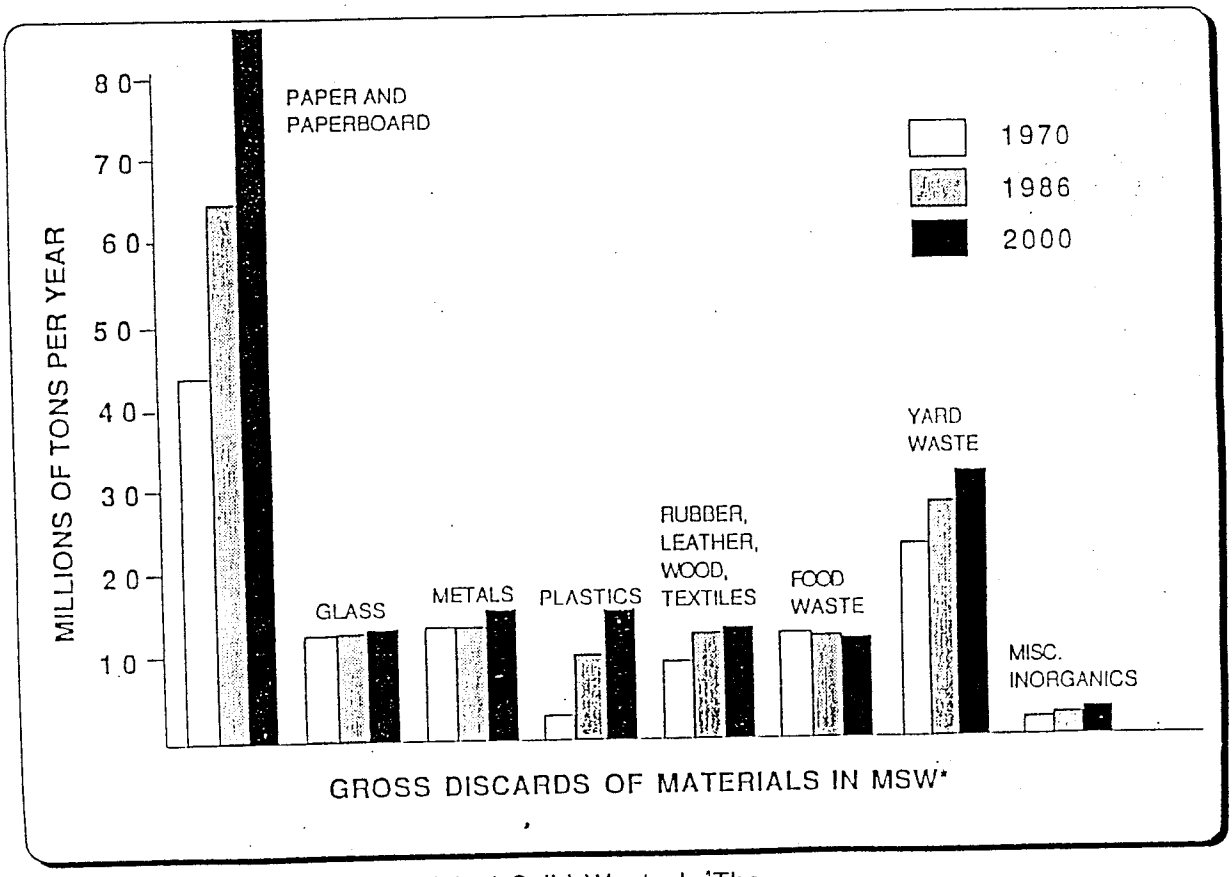
Source: Composition Summary for Preliminary Samples, Waste Characterization Study: Assessment of Recyclable and Hazardous Components, SRI International, June 1988

As Table 1 illustrates, paper and paper products, at 44.4 percent, are the largest component of California's waste stream. Also similar to the national figures, yard waste accounts for the second largest percentage of the garbage, at 14.4 percent. The remaining categories that amount to over five percent each are food waste (11.0 percent), glass (9.5 percent), and plastic (6.0 percent).

Just as the volume of solid waste is expected to increase, the composition of the waste stream is expected to change slightly. The most significant change is expected to occur because of the growing use of plastics. In 1970, plastics made up less than three percent of the solid waste stream in the United States; by 1984, its use had more than doubled, to 7.2 percent, and the EPA predicts that plastics will constitute nearly 10 percent of the country's solid waste by the year 2000.[9] Unlike other solid wastes, plastic does not break down and therefore does not make room for more waste in landfills.

Further, plastic materials are not recycled on a widespread basis, partly because they must be separated according to the different grades of plastic before recycling. Finally, plastics release toxic fumes when burned; thus, they increase the hazards of disposal by incineration.

Figure 3, which is taken from the EPA's September 1988 report, The Solid Waste Dilemma: An Agenda for Action, shows the changes in composition of the waste stream as well as the increase in the volume of waste generated in the United States.



*Ref: Characterization Of Municipal Solid Waste In The United States, 1960 To 2000; Franklin Assoc, 3/30/88

FIGURE 3

The responsibility for managing solid waste currently is divided among numerous state, federal and local agencies. The California Waste Management Board (CWMB) is designated as the lead agency in the State for planning and regulating solid waste disposal. The 1988-89 Budget Act provided the CWMB $5.5 million to carry out this mandate by researching waste management issues, regulating the various methods of waste disposal, establishing standards for landfill and incinerator operation and closure, and promoting "integrated waste management," which effectively balances the State's strategy for waste management among the various methods of solid waste disposal and reduction. The latter responsibility can be accomplished primarily through the review and approval of the individual counties' triennial plans for managing their solid waste.

The Department of Conservation's (DOC) Division of Recycling administers the 1986 Beverage Container Act (AB 2020) at an annual cost of $32.5 million, according to the 1988-89 Budget Act. The DOC's responsibilities include registering recyclers who participate in the 2020 program; administering the program's Distributors Contribution Fund; assessing processing fees and collecting the fees from beverage manufacturers; and paying out fees to the distributors and container manufacturers who participate in the 2020 program.

The State Water Resources Control Board (WCRB) is responsible for setting, monitoring and enforcing the standards for surface water and ground water contamination that results from disposal sites for solid waste. The WRCB fulfills its responsibility by establishing standards for landfill construction, drainage and containment, and for establishing the systems required for monitoring the water quality in and near waste disposal facilities. The actual monitoring is carried out by staff of the State's nine Regional Water Quality Control Boards and by staff of the various counties' public works and public health departments. The Budget Act for the current fiscal year provides $7.6 million for these activities.

The Department of Health Services' (DHS) Toxic Substance Control Division is responsible for setting requirements and standards for the handling and disposal of toxic and hazardous wastes. The DHS monitors toxic/hazardous waste disposal through its own efforts and the efforts of the counties' departments. In addition, the DHS becomes involved in issues regarding the cleanup of closed landfills that are found to contain toxic or hazardous materials. The 1988-89 Budget Act appropriated $13.1 million for these activities.

The State's Air Resources Board and local air districts enforce air pollution standards that apply to landfills and waste-to-energy facilities. In addition, the California Energy

Commission evaluates the energy market impact of large scale waste-to-energy proposals.

The EPA is the federal agency responsible for setting national standards for hazardous waste disposal. Only recently has the agency concerned itself with non-hazardous waste issues; it has generated draft standards for the operation of landfills and incinerators, and made policy recommendations for municipal waste operations.

Cities and counties have a dual role in the management of solid waste: they plan and operate disposal facilities and programs for solid waste, and they are responsible for the frontline monitoring and regulation of their own facilities and private facilities. The counties are required by state law to prepare and follow triennial plans for disposing of solid waste; the plans are reviewed and approved by the CWMB.

Scope and Methodology

In September, 1988, the Commission initiated its study of solid waste management in California. The purpose of this study is to identify the major issues related to solid waste generation and disposal, to determine the role of state and local governments in developing policies and systems to manage solid waste, and to evaluate the success of traditional policies of solid waste management and identify potential alternatives if necessary.

As a part of this study, the Commission held two public hearings on solid waste management. The first hearing, held in San Francisco on October 28, 1988, focused on solid waste generation and composition, the concept of an integrated system of solid waste management, and the role of state and local governments in developing integrated systems. At this hearing, the Commission received testimony from state legislators and representatives of state and local government, the recycling industry, and the refuse hauling and disposal industries. The second hearing, held in Los Angeles on November 18, 1988, focused on some of the problems associated with the disposing of solid waste in landfills and some of the alternatives to landfilling. At the second hearing, the Commission received testimony from representatives of federal and state government, the refuse hauling and disposal industries, and environmental interests.

In addition to the hearings, Commission staff interviewed numerous individuals in state and local government from California and other states, reviewed volumes of publications related to solid waste management, and visited two solid waste disposal facilities.

Report Format

In addition to the Executive Summary, this report is presented in four sections, the first of which is this introduction. The second section contains the three major study findings; the third section presents the Commission's overall conclusions and recommendations for addressing the issues related to solid waste management in California. The fourth section is an appendix that shows the remaining landfill capacity of the State's 58 counties.

STUDY FINDINGS

FINDING #1 - CALIFORNIA LACKS AN INTEGRATED SYSTEM FOR MANAGING ITS SOLID WASTE

Although state law outlines an effective policy of solid waste management which requires that the State employ various methods of waste disposal, California continues to rely on landfills to get rid of its garbage. Landfills continue to be the State's primary method of disposal because California's lead agency responsible for solid waste management policies has emphasized landfilling in past years and there has been little pressure to develop disposal alternatives. As a result, the State is generating more garbage than its landfill space can accommodate. For example, 15 counties are projected to exceed their landfill capacity by the end of 1996, and the entire State is expected to run out of landfill space by the turn of the century. Additional landfill space is difficult to develop because Californians do not want waste disposal facilities developed near them. Other effects of the State's reliance on landfills is the exposure of some Californians to health dangers and threats to the environment in some areas. Several studies have shown some landfills to be the cause of groundwater and surface water contamination, methane gas migration, and an assortment of problems ranging from unpleasant odors and vector problems to noise and traffic problems. Finally, California's reliance on landfills will result in long-run financial costs stemming from the unnecessary depletion of natural resources and the skyrocketing prices of dumping garbage in landfills that are becoming increasingly scarce.

Integrated System is Required... and Needed

The State Solid Waste Management and Resource Recovery Act of 1972 (Chapter 342, Statutes of 1972) states, among other things, that:

> The increasing volume and variety of solid wastes being generated throughout the State, coupled with the often inadequate existing methods of managing such wastes, are creating conditions which threaten the public health, safety and well-being by contributing to... the waste of dwindling natural resources and to the general deterioration of the environment.
>
> The traditional methods of solid waste disposal in this State directed largely to land disposal may not meet future requirements for eliminating environmental pollution and conserving natural resources.
>
> Methods of solid waste management emphasizing source reduction, recovery, conversion and recycling of all

> solid wastes are essential to the long-range preservation of the health, safety and well-being of the public, to the economic productivity and environmental quality of the State and to the conservation of the State's remaining natural resources. (Government Code Section 66701)

The intent of this law is to establish a multifaceted solid waste management policy that addresses the problems associated with garbage disposal. Such an approach would employ a system that integrates the various methods of waste disposal so that the State does not rely too much upon any one method of disposal. In addition, such an integrated system of waste management would ensure the most efficient use and maximum conservation of resources.

The EPA defines integrated waste management as "the complementary use of a variety of waste management practices to safely and effectively handle the municipal solid waste stream with the least adverse impact on human health and the environment."[10] The components of integrated waste management include source reduction, recycling, incineration and landfilling. When used to match the waste stream and demography of a community, these components form a complete system for the proper management of the solid waste in that community. Furthermore, an integrated waste management system can reduce toxics, reduce the quantity of waste, and safely recover any useful energy or material from the waste prior to its ultimate disposal.

Each community in California can "custom-design" its integrated waste management system. For example, a rural community with land readily available may choose to continue to rely on landfilling as its primary method of waste disposal; particularly after it evaluates the feasibility of source reduction and recycling. Conversely, an urban community may find recycling to be essential in handling its garbage.[11]

Hierarchy of Integrated Waste Management

The most effective way of reducing waste management problems is for states, local governments and the waste management industry to use integrated waste management in which the hierarchy is as follows:

1. source reduction;
2. recycling;
3. incineration; and
4. landfilling.[12]

Strict adherence to this rigid hierarchy may not be appropriate for every community, but it is important that communities attempt to reduce the amount of waste they produce and allow for the reuse of valuable materials before disposing of materials that are no longer useful.

The first priority in managing solid waste should be given to source reduction. Source reduction can occur through the design and manufacture of products and packaging with minimum toxic content, minimum volume of material, and/or a longer useful life. In addition, corporations and households can practice source reduction through selective buying habits and the reuse of products and materials.[13] Simply stated, this method makes sense because waste that is not generated does not need to be disposed of. Further, source reduction can decelerate the depletion of environmental resources, extend the life of landfills, and make landfilling and incineration safer by preventing potentially toxic materials from entering the waste stream.

The second priority in the hierarchy should go to recovering from the waste stream all of the materials that are recyclable so that the materials can be used again. This method attempts to make the most efficient use of resources that can be used more than once, before the resources are burned or buried. To dispose of such reusable resources suggests that the resources are limitless, that conservation is unnecessary, and that landfill space is infinite; all of these suggestions are false.

Once efforts have been made to reduce the amount of waste and recover all recyclable materials, the next priority should be given to incinerating the remaining waste to reduce the bulk of the waste and provide energy. The EPA suggests that although Incineration is not risk-free because toxins can be emitted into the air when certain materials are burned, and the residual ash produced by incineration sometimes contains heavy metals. However, the EPA suggests that a state-of-the-art incinerator that is well-operated should not present a significant risk to human health and the environment.[14]

Land is a precious commodity in most of California and should be treated as a nonrenewable asset. Therefore, landfills should be used as a last resort in the hierarchy of integrated waste management. This does not mitigate the importance of landfilling, however, because landfills are needed to handle nonrecyclable and noncombustible wastes. Further, landfills designated for handling incinerator ash residuals are essential and, in the absence of alternative ash management plans, must be planned and designed in conjunction with an incinerator.[15] Since there will always be a need for a landfill, steps must be taken to ensure that landfills are as safe as possible.

State Policy for Waste Management

The California Waste Management Board (CWMB) is responsible for setting state policy designed to reduce the volume of landfill disposal of nonhazardous wastes. However, even though it has been 16 years since state law required a change in the way California manages its solid waste, the State's reliance on landfills has continued. As recently as November, 1987, the CWMB has stated that "landfilling... must be...the cornerstone for an effective solid waste disposal and management system...." The CWMB indicated that landfilling is still, and will continue to be for the next 15 to 20 years, the major method of disposal for the State's waste.[16] Although we will always need landfills, the extent to which we should rely on them is debatable.

Of the 38 million to 40 million tons of non-toxic solid waste generated each year by Californians, approximately 90 percent is disposed of in landfills. Industry experts argue over how much of this garbage can be diverted from landfills, but everyone agrees that some greater amount can be diverted. In past years, industry experts, including the CWMB, have agreed that the State needed to decrease its reliance on landfills; unfortunately, rather than aggressively pursuing the alternatives of source reduction and recycling, the CWMB embraced incineration as the alternative having the greatest potential to reduce the volume of solid waste that is now buried in landfills.[17] Recently, however, the CWMB has taken a more positive role in the advancement of recycling. For example, the CWMB last year cosponsored three conferences related to recycling and conducted seminars on waste reduction and recycling technology earlier this year. Further, the CWMB has begun to strengthen regulations that should encourage more aggressive recycling efforts at the local level.

One reason for California's reliance on landfills is that, until recently, there has been little pressure on the CWMB to pursue alternatives. Only in recent years has the media attention focused on an impending garbage crisis. As further evidence that solid waste management is receiving increased attention, Governor George Deukmejian, in his January 1989 state of the State address, said that garbage reduction and recycling would be a top priority for his administration in 1989.

Difficulty in Siting Waste Disposal Facilities

Adding to the problems associated with the State's reliance on landfills, California is having increasing difficulty in locating sites for, and developing, new landfills to replace the ones that have reached capacity. Similarly, the State has trouble expanding existing facilities. Despite the CWMB's responsibility to encourage the timely planning and siting of adequate solid waste facilities, the State has fallen short of

guaranteeing sufficient waste disposal capacity. In 1985 and 1986, the State increased its net remaining landfill capacity by nine percent by expanding 11 existing landfills and opening one new landfill.[18] Since then, no expansions or new landfills have received final approval. Although there currently are 35 proposals for landfill expansion or construction of new landfills, the proposed sites either have not received needed permits, have not completed the Environmental Review Process, or are still in the preliminary design stage.

The problem of not being able to open or expand landfills is magnified when one considers that it will be very difficult to continue increasing landfill capacity at a rate fast enough to keep up with patterns of solid waste disposal. For example, the expansion of 11 existing facilities and opening of one new facility added only 122 million tons, or 18 months worth of dumping, to California's landfill capacity. During 1985 and 1986, when the additional space was created, 73 million tons of waste were disposed of in the State's landfills, an amount equal to 60 percent of the newly created capacity.[19]

Although the CWMB at one time pursued incineration as an alternative to landfilling, incinerator facilities have been nearly impossible to site. At one time, at least 39 waste-to-energy incinerators were slated for approval and construction in California.[20] Today, however, only three facilities are operating. Of the remaining 36 proposals, 32 are either dead or have no plans of opening in the near future and 4 others have made little progress.[21]

Not In My Backyard

The difficulty in siting new waste disposal facilities primarily stems from the "Not In My Backyard " (NIMBY) syndrome that is displayed by the public. Although they are perfectly willing to generate garbage at incredible rates, most Californians want their garbage to magically disappear; they assume that their waste will be hauled away from their houses to another place -- and that the "other place" will not be near them. To be fair, Californians are not unlike most Americans: They fear the typical problems associated with landfills and incinerators such as contamination of surface water and groundwater, odors, litter, methane gas migration, noise, dust, traffic, unsightliness, emission of toxins into the air, and heavy metals in the ash. Despite arguments from the government and the waste disposal industry that these problems can be addressed sufficiently to ensure a safe and pleasant environment, the public has consistently showed its unwillingness to live close to a landfill or incineration facility.

Contra Costa County is a good example of the NIMBY syndrome in action. For six months, the board of supervisors was

deadlocked over a decision to locate a landfill in one of two sites. The public pressure exerted on the supervisors was enormous; the majority of the pressure was to not locate a landfill in either of the sites. In 1988, the board of supervisors put four potential dump sites before the voters in four separate ballot initiatives. Holding true to the NIMBY syndrome, and perhaps sending a message to the supervisors that the county officials would have to accept the responsibility of a decision, the voters defeated each of the initiatives. Shortly after the election, one of the supervisors switched her vote, thus ending the deadlock; as a result, officials of the town in which the selected site was located threatened to file a lawsuit against the supervisors' decision. At the time of this report, the county is proceeding with plans to develop the landfill.

"Throwaway Society"

California is the most wasteful society in the world. This throwaway mentality is fostered by a number of things, including the types of products available to consumers. Nationally, we discard 1.6 billion pens, 2 billion razors and blades, and 16 billion diapers every year. "Convenience" packaging suited to our high-speed, increasingly busy lifestyle -- TV dinners, fast-food containers, microwavable bags of popcorn, and the like--make a substantial contribution to the flood of trash.[22] The proliferation of packaging is discussed in the Community Environmental Council's 1987 policy paper, Beyond the Crisis: Integrated Waste Management:

> Overpackaging has reached ridiculous heights. To adorn our consumer goods now requires a surprising portion of our nation's raw materials: 50 percent of the paper, 8 percent of the steel, 75 percent of the glass, 40 percent of the aluminum, and 30 percent of the total plastics output are used solely to wrap and decorate consumer products. Containers and packaging now account for about 33 percent of the total wastestream; approximately 9 percent of our grocery bill pays for packaging. In 1980, American consumers' "bill" for packaging totaled $50 billion.

Another situation that advances Californians' throwaway mentality is the artificially low cost of waste disposal through landfilling. Currently, the cost of dumping garbage in landfills does not reflect all the costs associated with landfills. The labor and capital costs of picking up, hauling away and disposing of garbage are included, but the costs of closure and post-closure monitoring, maintenance and cleanup are not. Moreover, the cost of replacing landfills is not included in the cost of landfill disposal. Because many landfills are valued at the price of property when the landfills are opened,

the existing landfills are inexpensive. However, landfills are reaching capacity quickly; if their value is set at the cost of finding replacements, their value will rise dramatically.[23]

The Assembly Office of Research's April 1988 report, Integrated Solid Waste Management: Putting A Lid on Garbage Overload, discusses the problem of artificially low landfill costs:

> Philadelphia, which has run out of landfill space and is scrambling to secure disposal rights out-of-state even on a month-by-month basis, pays about $75 to get rid of a ton of garbage. In New Jersey, the cost of dumping at a municipal or private landfill, called a tipping fee, is expected to reach a new high of $112 per ton this year, up from $20 to $30 less than a year ago. Ohio, with plenty of landfill capacity in reserve, charges as little as $3 a ton, and is attracting garbage trucks from a number of East Coast cities despite the obvious costs of transportation.
>
> Where does California fit in this national pattern? A 1987 tipping fee survey of 80 solid waste landfills throughout the U.S., conducted by the National Solid Waste Management Association, determined that the average fee charged at landfills was $20.36 per ton, up 51 percent over 1986. Landfill tipping fees for the four California cities included in the survey -- Long Beach, Richmond, Sacramento, and San Diego -- averaged $11.57, 43 percent less than the national average. ...tipping fees have increased over the last three years in these cities as well as Los Angeles and San Francisco.

A third circumstance that fosters a throwaway mentality is the absence of a clear relationship between the fees paid by some Californians for the collection and disposal of garbage and the actual cost of providing the services. Although some people are charged on a "per can" or "per bag" basis, many people are charged a flat fee for garbage collection regardless of the amount of trash thrown away. In Los Angeles, the garbage collection fees are hidden in people's property tax bills; increases in such fees are not likely to receive the same scrutiny as if the fees were billed separately. If the public's collection fees are not tied directly to the amount of garbage thrown away, or if a person is not aware of the amount of his or her garbage collection fees, there is not much monetary incentive to reduce the amount of garbage thrown away. If people pay in accordance with what they dispose of, they are more likely to work at reducing the amount of their garbage. For example, one town in New Jersey switched from a flat annual fee for garbage collection to a "per bag" fee and reduced the amount of waste

generated by 25 percent. Communities from as far away as Utah have since contacted the New Jersey town to learn how its system works.[24]

No Place to Dump the Garbage

Dwindling landfill capacity is the obvious result of an equation that combines an increasing amount of waste generated, a continued reliance on landfills as the primary method of waste disposal, and a decreasing ability to site new landfills or expand existing landfills. Simply stated, the State is throwing away more garbage than its landfill space can handle. Based upon current remaining disposal capacity at landfills statewide and the rate at which Californians now generate waste, the State will run out of landfill capacity by the year 2000.[25]

Although this estimate does not allow for new or expanded landfill facilities, or for the effects of source reduction and recycling efforts, it also does not take into account the effects that one county's loss of disposal capacity might have on surrounding counties. When a county exceeds or approaches its landfill capacity it will look outside its borders for garbage disposal sites. As a result, the remaining capacity in neighboring counties will probably decline even faster than the projected rate. For example, San Francisco has no landfill capacity and must haul its garbage to a landfill in a neighboring county.

The remaining landfill capacity of counties is varied throughout the State. The appendix of this report shows the remaining capacity through 1996 for each of the State's 58 counties. Los Angeles County, which by itself accounts for approximately 38 percent of the State's garbage, has landfill capacity projected to last only until 1994. Some central and northern counties such as Madera and San Mateo will run out of landfill space even sooner. Table 2 shows the 15 counties that currently have less than eight years of capacity remaining as of January 1, 1989. Because of the long lead time required to site and permit a new landfill, the CWMB considers counties with less than five years capacity to face an "emergency" and counties with between five and eight years capacity to face "serious" disposal problems.

TABLE 2

CALIFORNIA'S DECLINING LANDFILL CAPACITY

Counties With Less Than Eight Years Capacity
As Of January 1, 1989

County	Years Remaining
Calaveras	Less than 1
Madera	Less than 1
Del Norte	1
San Mateo	1
Contra Costa	2
Tuolumne	3
San Benito	4
San Bernardino	4
Sonoma	4
Ventura	4
Los Angeles	5
Lassen	5
Kings	5
Kern	7
Sierra	7

Source: California Waste Management Board

As shown in Table 2, there are several heavily populated counties, such as Los Angeles, San Bernardino, San Mateo, Contra Costa and Ventura, that generate large amounts of waste and that face emergency or serious disposal problems. The table also shows a number of rural counties facing a garbage crisis. Without additional capacity, all of these counties will incur higher disposal costs that will ultimately be borne by the public.

Higher Disposal Costs

California can learn a lesson from other states that have run out of landfill space. Once an area exceeds its landfill capacity, it will incur substantial transportation costs to ship out all the garbage intended for landfilling. The transportation costs then become part of the overall disposal costs, raising fees to record highs. For example, if New York City's only remaining landfill were exhausted tomorrow, and the city had to ship its annual eight million tons of solid waste to Ohio at $120 per ton, as many of its neighboring communities do, it would cost the city a staggering $1 billion a year. That

amount is equal to twice the city's current sanitation department budget.[26]

In addition to transportation costs, once it becomes apparent that there is a dearth of landfills, the economic law of supply and demand will increase the tipping fees at the remaining landfills. The scarcity of landfill space in some states has caused disposal costs to rise sharply --from $10 or $12 per ton on average to $70, $100, $120 and even $205 per ton.[27]

Depletion of Natural Resources

The long-run costs of landfilling will not be limited only to higher disposal costs; the depletion of natural resources is also an adverse effect. By burying materials that could be used again, the State is eliminating a portion of the supply that can be used to satisfy future demand for those materials. Instead, natural resources will have to be used to satisfy the future demand. Thus, a continued reliance on burying reusable materials will deplete the limited supply of existing natural resources. This axiom is clearly supported by the State Solid Waste Management and Resource Recovery Act of 1972, which identified "the waste of dwindling natural resources" as a problem that results from landfilling.

Environmental and Public Health Threats

The public's fears that are the basis for the NIMBY syndrome are not without foundation, particularly in the case of landfills. Formerly thought of as relatively harmless compared to the potential damage that could be caused by dumping hazardous wastes, solid waste landfills are now recognized as threats to the environment and public health.

Relatively minor but frequently occuring problems include blowing litter, unpleasant odors, flies and other vector problems, primarily occur because of failure to establish landfill cover standards. Other nuisances, such as noise, dust and traffic problems, are more a result of the operational nature of landfills.[28]

A more serious problem stemming from landfills is the migration of the methane gas naturally produced by the decay of organic materials. Methane disperses rapidly in open air, but it can migrate through the soil surrounding a landfill, concentrate underground and in confined spaces beneath structures, and explode, trigger fires, and/or adversely affect the health of residents. After discovering that methane gases were migrating from its landfill toward a residential area in 1988, the City of Sacramento was forced to construct barrier trenches to block the movement of the gas. The migrating gas was also suspected of causing damage to and killing a portion of the riparian habitat

between the landfill and the American River.[29] In two separate episodes in 1983 and 1985, gas migrating from the Sheldon-Arleta Landfill in Los Angeles County's San Fernando Valley forced a school to temporarily close certain buildings after the gas was detected at explosive levels.[30]

Perhaps the most dangerous threat stemming from landfills is the contamination of surface water and groundwater. Because of a lack of monitoring, the extent of water contamination resulting from California's landfills is unknown. However, it is generally agreed that the problem is widespread. In its June 1985 report, A Comprehensive Plan For Management Of Nonhazardous Waste In California, the CWMB indicated that there was evidence of groundwater contamination throughout the Central Valley. The Assembly Office of Research, in its April 1988 report, Integrated Solid Waste Management: Putting A Lid on Garbage Overload, also reported on the problem of surface water and groundwater contamination:

> A limited telephone survey of (the State's) Regional (Water Quality Control) Boards conducted by AOR in 1987 revealed that benzene and vinyl chloride, both known human carcinogens, have been found in groundwater beneath the Monterey Peninsula landfill at levels exceeding Department of Health Services (DHS) health standards. In March 1987, benzene was detected in surface runoff from the Redding City Sanitary Landfill at levels 285 times the DHS standard. The runoff entered Linden Creek, which flows into the Sacramento River.
>
> In addition, a review of landfill records conducted by the Toxics Assessment Group revealed the presence of groundwater or surface water contamination at every one of the eight landfills investigated (Mission Canyon, Nu-Way, Puente Hills, Sheldon-Arleta and Sunshine Canyon in Los Angeles County; Altamont in Alameda County; Ox Mountain in San Mateo County; and Sacramento City in Sacramento County). For example, at Puente Hills Landfill in Los Angeles County, groundwater monitoring data indicate the presence of volatile organic contaminants on-site. The site is adjacent to the San Gabriel Valley Ground Water Basin, the major source of drinking water for 1.8 million people. Surface water testing at Sunshine Canyon Landfill in Los Angeles County reveals elevated levels of chlorine and total organic carbon. Surface water from this site drains to the San Fernando Valley Reservoir.

In testimony given to the Little Hoover Commission at its hearing on solid waste management on November 18, 1989 in Los Angeles, the chief deputy director of the DHS suggested that all

of California's landfill sites, whether the landfills are active or closed, "contain various quantities of substances that, today, we would consider to be hazardous."

The problem of landfill contamination has more than one origin. In past years, before strict dumping standards were set, some landfills accepted waste that today would be classified as hazardous. Although many of these landfills are closed now, their toxic legacy remains to jeopardize nearby communities. Another source of contaminants is a special class of solid waste called household hazardous waste.

Household Hazardous Waste

Seemingly innocent household items such as cleaners, paint, batteries and certain cosmetics comprise a portion of household hazardous waste. Table 3 shows a more complete list of items that are considered household hazardous wastes.

TABLE 3

TYPES OF HOUSEHOLD HAZARDOUS WASTES

Household Cleaners

- Toilet Bowl Cleanser
- Drain Opener
- Laundry Soap
- Bleach
- Dish Washing Detergent
- Bathroom Cleaners
- Ammonia-Based Cleansers
- Polish
- Floor Finish
- Air Freshener
- Other Household Products (e.g., oven cleaners)

Automotive Maintenance

- Oil
- Transmission Fluid
- Engine Treatment
- Antifreeze/Coolant
- Auto Wax
- Other Auto Products (e.g., grease solvents, rust solvents, refrigerants)

Household Maintenance

- Paint
- Paint Thinner
- Stain/Varnish
- Glue
- Others

Pesticides & Yard Maintenance

- Fertilizer
- Pesticides
- Herbicides
- Pet Maintenance

Batteries & Electrical

- Auto and Flashlight Batteries
- Solder

Prescription Drugs

- Diverse

Selected Cosmetics

- Nail Polish Remover
- Hair Spray
- Make-up Remover
- Dyes

Other

- Pool Chemicals
- Hobby-Related Materials
- Miscellaneous

Source: U.S. Environmental Protection Agency, Characterization of Household Hazardous Waste From Marin County, California, and New Orleans, Louisiana, July 1987, pp. 12, 17-20.

Although many of these materials are not permitted in solid waste landfills, they make their way into the municipal waste stream either through the intent or ignorance of the public. A specialist in environmental law considers these wastes "the major culprits at the end of the toxic trail... When dumped, this ordinary rubbish decomposes to form a carcinogenic soup, every

bit as hazardous, if not as concentrated, as the chemical hazardous waste generated by industry."[31] In his testimony submitted to the Commission, the chief deputy director of the DHS cited as the primary cause for the supply of hazardous substances "the fact that the public has historically mixed household hazardous waste with their other garbage which was deposited in the local sanitary landfills."

The report cited as a source for Table 3, the EPA surveyed residential solid waste in Marin County and New Orleans, Louisiana to determine the amount and characteristics of the hazardous portion of the waste. The survey found that hazardous wastes comprised approximately one-half of one percent of the solid waste stream in the two cities. Although this amount may seem inconsequential, the EPA called it "substantial." Based on the average household's weekly disposal of 55 to 60 grams of hazardous waste, the EPA estimated that Marin County annually dumped almost 285 tons of hazardous wastes into solid waste landfills.[32]

A similar study in San Mateo County, conducted for the CWMB in 1987, showed that hazardous materials were 0.29 percent by weight of the garbage that was collected by a refuse disposal company, and 0.59 percent by weight of the waste that was brought to a transfer station by residential customers to dispose of themselves. The study further showed that automobile batteries, household batteries and paint accounted for the bulk of the designated household hazardous material.[33]

In Summary...

Despite the requirements of state law and an effective policy of solid waste management, California lacks an integrated system of managing its solid waste. Instead, the State continues to rely on landfills to get rid of its garbage and does not place sufficient emphasis on alternative methods of disposal such as recycling and source reduction. Landfills continue to be California's primary method of garbage disposal because the CWMB has emphasized landfilling in past years and there has been little pressure to develop disposal alternatives. Because of its reliance on landfills, the State is generating more waste than its landfill space can accommodate, some Californians are exposed to health dangers, the environment in some areas is threatened, and the long-run financial costs to the public could be enormous.

FINDING #2 - THE STATE LACKS A COMPREHENSIVE STATEWIDE RECYCLING PROGRAM

Supporting the rationale behind integrated waste management, state law and the concepts of conservation demand that recycling be a major part of California's system of handling garbage. However, because of a lack of leadership, the State has not developed a comprehensive recycling program. As a result, valuable resources are depleted unnecessarily and California continues to rely heavily on landfills as its primary method of waste disposal.

Recycling Makes Sense

The State Solid Waste Management and Resource Recovery Act of 1972 requires that the State emphasize recycling as part of an integrated system of solid waste management because it is "essential to the long-range preservation of the health, safety and well-being of the public, to the economic productivity and environmental quality of the State and to the conservation of the State's remaining natural resources." The intent of the legislation is obvious: the State should recover from the waste stream all of the materials that are recyclable so that the materials can be used again. This method makes the most efficient use of resources that can be used more than once. For example, every ton of paper made from recycled material saves 17 trees. Clearly, introducing recoverable materials into the manufacturing cycle reduces the consumption of precious natural resources. It only makes sense to get the most use out of California's resources; to do otherwise would falsely suggest that the resources are limitless and that conservation is unnecessary.

In its April 1988 report, Integrated Solid Waste Management: Putting A Lid on Garbage Overload, the Assembly Office of Research called recycling "the linchpin of an integrated waste management system, the essential component that determines a system's success or failure." The report pointed out the importance of recycling to integrated waste management by outlining seven objectives that a successful recycling program should meet:

1. Reduce solid waste volume to ease the landfill capacity crisis.

2. Reduce the need for incinerating waste.

3. Remove from the waste stream toxic materials that make incineration and landfilling unacceptable alternatives.

4. Remove materials that reduce the efficiency of incineration.

5. Recover valuable materials for reuse and economic benefit.

6. Conserve virgin resources.

7. Meet the demand for landfills and incinerators only as a last resort.

Although these objectives appear lofty, their importance is recognized by those who have attempted to develop a successful system of managing solid waste.

Other States Are Recycling

Some other states are much more advanced than California in the development of recycling as a major method of waste management. In some cases, particularly in the eastern part of the nation, the development of recycling evolved from the decline or lack of landfill space.

Faced with only three years life expectancy for its sole remaining landfill, and a corresponding hike in tipping fees from between $20 and $30 per ton to $112 per ton, New Jersey established what some consider to be the most comprehensive statewide recycling program in the United States.[34] On April 20, 1987, after a two-year legislative effort, the Governor of New Jersey signed into law the New Jersey Statewide Mandatory Source Separation and Recycling Act. As its title suggests, the Act requires counties to submit and implement plans to recycle at least 25 percent of their waste. Further, the county plans must include mandatory source separation of at least three recyclable materials plus leaves, which are banned from landfills. Moreover, the county plans must identify explicitly how materials are to be processed and marketed. However, if no markets exist the counties are not required to meet the recycling goals.[35]

The New Jersey law is not limited to merely setting recycling requirements for local government. The law also provides for the creation of markets for recycled materials by requiring state government to purchase specified amounts of recycled paper, to use compost materials in the maintenance of public lands, and to purchase crumb-rubber asphalt and glass for highway construction projects. In addition, the state government sets aside general revenues to fund market development studies and provides start-up grants for local recycling projects. Further, the state provides tax credits for investments in recycling equipment. Finally, New Jersey set up a recycling fund supported by revenues from a surcharge on each ton of waste landfilled. Monies from the fund are distributed in the form of

grants to communities based on tonnage of waste recycled, low-interest loans for recycling enterprises, funding for statewide programs related to recycling education, and grants for county recycling program.[36]

Rhode Island, New York, Pennsylvania, Florida, Maryland, and Oregon are among other states that have developed statewide, comprehensive recycling programs. These states offer varying forms of tax incentives for investment in recycling equipment, grants for local government to establish recycling programs, funding for the development of markets for recycled materials, and mandatory procurement of recycled materials by state government.[37]

How California Stacks Up

Although it generates more waste than any other state in the nation, California recycles less than ten percent of its trash. Despite this inconsistency, the State's only statewide recycling program is the Beverage Container Recycling and Litter Reduction Program (AB 2020, Statutes of 1986), which affects only a minuscule portion of the State's waste stream; at best, the program could divert from landfills only three to four percent of the State's garbage.[38] There are other state laws that require each county to identify what it will do with its solid waste if its landfill will be at capacity in less than eight years, and to provide a plan to establish a goal of recycling 20 percent of its waste and identify actions it will take to achieve the goal. Further, state law makes a county's new solid waste facility permits valid only if the county adopts the 20 percent recycling plan. However, these laws fall short of mandating that counties implement any plans they may establish. Therefore, a county could continue to rely primarily on its landfill space or rely on landfills outside the county even though the county has a plan for recycling 20 percent of its waste. Considering this, the State has not been successful in establishing a comprehensive statewide recycling program.

There are some successful local recycling efforts in California, however, including the city of San Jose and Marin County. San Jose's Curbside Recycling Program was established in 1985 in an attempt to reduce the city's waste stream by 25 percent. Using trucks designed with three bins -- one each for cans, bottles, and newspaper -- a private contractor collects the materials weekly from residents after the residents voluntarily sort the materials and place them in separate containers. The materials are then hauled to a processing yard, sorted, and sold as recyclables. Since the first year, the city has experienced savings in garbage collection and landfill space, has enjoyed a participation rate above 50 percent, and has received revenues from the sale of the recyclables in excess of the cost of the program.[39]

Marin County has also been successful in operating a curbside recycling program. The Marin Recycling and Resource Recovery Association, a private recycling organization subsidized by Marin County, collects paper products, glass, aluminum and tin cans, and waste oil. The operation has grown from collecting 1,000 tons in 1981 to 25,000 tons in 1988, and enjoys a 65 percent participation rate. Approximately 80 percent of the revenue for the operation comes from the sale of recyclables, and a household surcharge for the garbage collection accounts for the remaining 20 percent. The program currently diverts from landfills about 25 percent of the waste stream,[40] and each ton recycled is worth over $35 in savings by avoiding disposal in a landfill.[41]

Unfortunately, the examples above are exceptional and California is sorely lacking a comprehensive statewide recycling program.

Failed Legislative Attempts

Recent attempts to mandate recycling on a statewide level have failed. In 1988, California witnessed the failure of AB 3298 (Killea/Cortese), which would have required counties to prepare, adopt, and implement a waste reduction and recycling plan that would divert from landfills 25 percent of the solid waste generated by the counties. Although the Legislature passed the bill, the Governor vetoed AB 3298. In his veto message, the Governor stated that he believed the bill would result in an unnecessary duplication of state oversight and would separate recycling from other waste management plans. Proponents of the bill, however, claim that the legislation would have repealed existing laws related to the oversight of recycling and would have allowed sufficient time for a transition to the new procedures so as not interfere with other waste management plans.[42]

Another bill in 1988, AB 3746 (Eastin), would have required state agencies, the California State University system, and the Legislature to buy more recycled products. This bill was also vetoed by the Governor, who stated in his veto message that the State should not guarantee a market for recycled products. Further, the message stated that to purchase these products would not be cost effective and would, therefore, violate the public's trust in the State's high standards for procurement. The author of the bill claimed that the Governor received bad information from the Department of Finance which failed to consider the costs and risks that the State would be avoiding by not using landfills for the amount of waste recycled.[43]

The following are brief descriptions of some other bills that were passed by the Legislature in 1988 but were vetoed by the Governor.

- AB 4498 (Sher) would have provided a procurement preference for the State's purchase of recycled oil, and would have required local agencies to purchase recycled oil if it was available and of the same or better quality than virgin oil products. The veto message was similar to the one for AB 3746, stating that the State should not guarantee a market for recycled products and that to purchase these products would not be cost effective and would, therefore, violate the public's trust in the State's high standards for procurement.

- AB 4607 (W. Brown) would have regulated the disposal of tires and would have imposed a disposal fee on persons leaving tires for disposal with a tire seller. The proceeds from the fees were estimated to be $20 million annually and would have been used for grants and research into tire disposal and recycling uses. The Governor stated in his veto message that the goals for the use of the money were not well defined or measurable, that there was no process for approving the use of the money, that there was no criteria specifying how to measure the results of the bill, and that there was no accountability as to how the bill served the public interest.

- SB 188 (Alquist), which would have provided a ten percent tax credit for using recycled materials in the production of new products. The Governor, in his veto message, expressed his concern about the loss of General Fund revenue that would result from the legislation, and said that the bill would move the State away from the desired goal of simplicity in the state income tax forms and their conformity with the federal forms.

Undaunted by their failed attempts in the last legislative session, many of the same legislators are trying again to pass laws that would become part of a comprehensive statewide recycling program. Given the Governor's most recent indication of commitment to solve the problems, as stated in his January 1989 State of the State address, the timing may be right for progress in advancing recycling in California.

California Waste Management Board Did Not Pursue Recycling

As California's lead agency for solid waste management, the California Waste Management Board (CWMB) must assume some of

the responsibility for the State's lack of a comprehensive recycling program; particularly since the CWMB did not aggressively pursue recycling in past years. Evidence of the level of priority that the CWMB placed on recycling is in the CWMB's June 1985 report, A Comprehensive Plan for Management of Nonhazardous Waste in California. In the report, the CWMB presents a policy of solid waste management that places recycling after landfilling and incineration. Results of this policy are evident in the CWMB's past actions, which have emphasized landfills and incineration facilities. The primary attention given to recycling was in response to a grant program created by SB 650 (Chapter 1161, Statutes of 1977), which caused the CWMB to provide $11 million between 1978 and 1981 to support more than 100 local projects for recycling, secondary materials processing and composting. Although the grant program was a positive step to advance recycling, it cannot be considered an aggressive policy supporting a comprehensive statewide recycling program.

Some of the CWMB's recent actions also appear to have been less than supportive of statewide recycling efforts. For example, of the recycling bills proposed in 1988, the CWMB supported only two (AB 3746 and AB 4607), and either opposed or had no position on the remaining bills. Further, the CWMB opposed the Beverage Container Recycling and Litter Reducation Program (AB 2020, Statutes of 1986). In addition, the CWMB still has not completed and submitted to the Governor and the Legislature biennial reports that identify markets for recyclable materials, even though state law has required the CWMB to do so for over 11 years.[44] Finally, the CWMB decided not to release a report, which it completed in December 1987, that shows it costs $14.96 more per ton to dispose of garbage in landfills than it costs for curbside recycling.[45]

Conversely, the CWMB recently has taken actions that can be considered favorable to recycling. For example, it cosponsored three recycling-related events: a January 1988 conference, "Safe Waste Disposal and Utilization," which examined alternatives to landfill disposal; a March 1988 conference, "Recycling Markets: California and the Pacific Rim," which explored the potential to strengthen the State's secondary materials market relationship with its Pacific Rim neighbors; and the May 1988 California Resource Recovery Association annual conference. Further, the CWMB earlier this year conducted seminars on waste reduction and recycling technology for local officials and recycling coordinators in Northern and Southern California. Finally, the CWMB has begun to strengthen regulations concerning the requirement that counties review recycling opportunities in the counties' solid waste management plans. According to the CWMB, this revision should encourage more aggressive recycling efforts at the local level.[46]

Regardless of the CWMB's or the Legislature's efforts to establish a comprehensive statewide recycling program in California, the success of such a program largely depends on the availability of markets for recyclable materials and for products made with recycled materials.

Economics of Recycling

There are concerns that if there is a sudden, substantial increase in recycling, such as if the State were to mandate recycling by all counties, the market for recyclable materials will experience a glut. Under this scenario, the glut would cause a decrease in the prices of the materials and the market would not be able to sustain recycling companies.

One consideration, though, is that the effect of a glut would probably be short-term. If the demand for recycled products is elastic, as the price sensitivity of recyclable materials suggests, then the drop in prices would be followed by an increase in demand for the products and the increase in demand would drive the prices back up, encouraging a greater supply of materials. This theory does not suggest that the development of markets for recycled products is unnecessary, however. Given the potential supply of recyclable materials, the demand for recycled products eventually would have to increase to ensure that more than only a few, financially strong recycling companies could survive in the swings of the market.

Obstacles to Developing Markets

Although the development of markets for recycled products is necessary, there are some barriers that must be addressed before development can occur. One such barrier is the artificial inexpensiveness of landfill disposal. Despite the CWMB's findings that the cost of landfilling in California is more expensive than the cost of curbside recycling, the difference in cost may not be substantial enough to cause a change in the market. In some areas, the cost of landfilling still may be too low to cause an increase in recycling. In its 1987 policy paper, Beyond the Crisis: Integrated Waste Management, the Community Environmental Council concluded after reviewing numerous case studies that "when tipping fees reach $25 or more per ton recycling and incineration become feasible waste management options." As indicated earlier, some other states impose surcharges on landfill disposal. In addition to raising operating revenues for recycling programs, the surcharges create an incentive for recycling by discouraging the use of landfills.

Another obstacle for developing markets for recycled products is the high cost of financing expansion in the recycling industry. Specifically, it is expensive to purchase equipment that processes or utilizes secondary materials in manufacturing.

Recycling companies that will process the materials are reluctant to risk major capital investments in automated or mechanical equipment if they are unsure about the market for the materials. Likewise, manufacturers will not invest in equipment that can use recyclable materials in the production of recycled goods unless they are assured of receiving a consistent amount of high-quality materials at a reasonable price. As mentioned earlier, some states use landfill disposal surcharges to fund recycling programs and low-interest loans and tax credits to encourage recycling industry expansion.

A third obstacle in developing a market for recycled products is the relative inexpensiveness of virgin materials. As explained earlier, the forces of supply and demand affect the prices of recycled products. Currently, the prices of some products, such as certain grades of paper, made of virgin materials are less than similar products made from recyclable materials. However, if one considered the costs of depleting natural resources for the virgin materials and the costs associated with landfills that will be used to bury the materials that are not recycled, the demand for the recycled products would increase. Some states have procurement policies for this very reason; they avoid the costs associated with virgin materials and provide demand for the recycled products.

Ironically, the prices of some virgin materials are cheaper than recyclable materials because the state and federal tax codes give tax advantages to companies for oil, mineral and timber depletion. Thus, these tax advantages adversely affect efforts to establish an effective program of recycling in two ways: they create inequities in the market by giving virgin materials an advantage and they encourage the depletion of natural resources.

Some perceptions held by consumers can also be considered obstacles in the development of markets for recycled products. For example, consumers have strict aesthetic requirements for the paper packaging they use. Boxes made with significant quantities of mixed wastepaper look yellow but are functionally unimpaired, as evidenced by the packaging coming from Asia. The appearance of such boxes are unacceptable by American consumers, however, so manufacturers do not use large amounts of recyclable materials in boxes.[47] Only education of the consumers will overcome the obstacle presented by aesthetic concerns.

Adverse Effects of Not Recycling

Because recycling is key to the success of integrated waste management, the consequences of not recycling in California are the same as the adverse effects suffered as a result of the State's current reliance on landfills. The State is unnecessarily depleting natural resources and valuable landfill

space, subjecting its public to higher disposal costs in the long run, and posing threats to the environment and public health.

FINDING #3 - THE CALIFORNIA WASTE MANAGEMENT BOARD HAS BEEN INEFFECTIVE

Although it is the lead agency for managing the State's solid waste, the California Waste Management Board (CWMB) has failed to meet its responsibilities to encourage integrated waste management and discourage the use of landfills. Recent efforts by the CWMB have been more supportive of its statutory objectives, but the CWMB's effectiveness is still hindered by the public's attitude toward solid waste and the common perception that the CWMB is not independent of certain interests in the waste industry. As a result, California lacks a lead agency that can effectively address the State's current solid waste problems.

State's Problems Are Evidence of Ineffectiveness

The Governor's Budget for fiscal year 1989-90 describes the purpose and objectives of the CWMB as follows:

> The purpose of the (CWMB) is to establish and maintain a comprehensive waste management and resource recovery policy for nonhazardous waste. The (CWMB's) major objectives are to protect the public health and safety, to preserve the environment, to reduce the volume of landfill disposal of nonhazardous wastes and to encourage the timely planning and siting of adequate solid waste facilities.

Given California's lack of an integrated system for managing solid waste, its lack of a comprehensive statewide recycling program, and its consequent reliance on landfills which are rife with inherent problems, the CWMB cannot be considered effective in serving its purpose and meeting its objectives. The CWMB's failure to fulfill its goals has adverse effects on the State's inhabitants and environment.

The CWMB has recently taken some actions that are more supportive of its role and responsibilities. However, these efforts fall short of addressing some of the causes of the solid waste problems in the State. Specifically, the effectiveness of the CWMB is hampered by the public's throwaway mentality and tendency toward the NIMBY syndrome. Perhaps even more importantly, though, is the corrosive effect on the CWMB's leadership by the common perception that the CWMB is influenced by the waste industry.

Perception of Undue Influence

Government Code Section 66740 requires that two of the nine members of the CWMB be representatives of the private sector of the waste industry. Having board members that are working in the industry that the CWMB regulates is designed to provide the

expertise and knowledge to ensure effective, competent board decisions. The danger in having such representation is that the representatives are in a position to act in their own self interest, even if only indirectly. Whether such a conflict of interest has actually occurred in the case of the CWMB has been hotly debated over the years that the CWMB has been in existence. In particular, critics contend that the CWMB is overly influenced by trash haulers who do not stand to benefit from increased recycling. This report does not attempt to prove one side of the argument or the other; rather, the potential of a conflict and the common perception that there is a conflict are issues enough.

Although the law requires that at least two members of the CWMB represent the waste industry, the law does not limit the number of representatives from the waste industry. Until recently, the CWMB had at least four members who were tied to the waste industry either financially or through employment. Such a preponderance of persons who could possibly be construed as representing the waste industry only serves to perpetuate the perception that the CWMB is unduly influenced.

Regardless of the number of representatives of the waste industry, Government Code Section 66749 prohibits members of the CWMB from participating in any CWMB action that involves the member or any solid waste handler with which the member has an employment or financial interest. The statute further prohibits any member from attempting to influence any decision or recommendation by any employee of or consultant to the CWMB in any such action. However, the CWMB has no method of recording the voting records of its members related to actions taken by the CWMB. Transcripts of CWMB meetings show voice votes rather than roll call votes. Without knowing whether particular members voted on particular actions, or how they voted, it is difficult to gain assurance that conflicts of interest do not exist. Again, such circumstances only foster perceptions that conflicts exist.

The following circumstances also exist in the CWMB.

- Although members are not allowed to be involved in any action that may affect them, the very fact that they can be employed by the waste industry means that they are allowed to earn outside income from those affected by the CWMB.

- There is no limit on ex parte communications (outside of official forum) by anyone appearing before the CWMB in a quasi-judicial matter. Thus, it is possible that interactions between a person and the CWMB could greatly influence the CWMB's actions in a quasi-judicial matter but not become a matter of public record.

- Members and CWMB staff are not restricted from working on anything affected by the actions of the CWMB after the members' or staff's departure from the CWMB. Under such a circumstance, it is possible for a member to affect a situation that could personally benefit the member directly upon leaving the CWMB.

The make-up and procedures of the CWMB allow for the potential of the members to not act in the public's best interest. Although the members may not have any conflict of interest and the common perception that the CWMB is unduly influenced may be incorrect, board membership could be changed to promote an appearance of independence on the part of the CWMB. As they stand, the circumstances only further the public's concerns.

These concerns are fueled by the recent occurrence of events that have cast a dim light on the actions of the CWMB. For example, in 1988, the CWMB's chairman quit the CWMB after a state Senator began an investigation into allegations of misconduct on the part of the former chairman. Although no charges were made public, the actions were perceived as having illuminated long-term problems that have existed in the CWMB. As recently as May 1989, events occurred that again raised the issue of conflict of interest. A 13-year member of the CWMB resigned amidst the discovery that he continually voted on issues that may have affected a waste company for which he is a manager. What is being argued is whether the issues the former member voted on had a significant financial effect on his employer. Regardless of the final outcome of this controversy, the common perception related to the CWMB is once again perpetuated.

Lack of Credibility

The CWMB's ineffectiveness has resulted in its loss of credibility, particularly with the Legislature. This lack of trust by the State's lawmakers can be seen in legislation that has been presented to the Governor. In 1986, the Legislature selected the Department of Conservation (DOC) rather than the CWMB, the State's lead agency for solid waste management, to administer the Beverage Container Recycling and Litter Reducation Act. Further, the list of bills vetoed by the Governor in 1988 included more legislation that would have entrusted statewide recycling programs to the DOC rather than the CWMB. The current legislative session continues to include solid waste bills that shun the CWMB; one bill even proposes to eliminate the CWMB and create an entirely new board. In his testimony at the Little Hoover Commission's hearing on October 28, 1988, Assemblymember Dominic Cortese summed up the CWMB's credibility problem by saying, "...the Legislature would be remiss if it gave more

responsibilities to an agency when it is having difficulty complying with current requirements."

The failures of the CWMB and consequent lack of credibility leave California without a lead agency that can effectively address the State's solid waste problems. Although the CWMB may have learned from its past mistakes, it will have to address its credibility problem before it can turn to solid waste issues.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Although state law outlines an effective policy of solid waste management which requires that California employ an integrated system of managing its solid waste, the State continues to rely on landfilling as its primary method of getting rid of its garbage and lacks a comprehensive statewide recycling program. The reasons for the State's condition are numerous, including the inconsistency between the public's throwaway mentality and intolerance for solid waste facilities, the complexities of the markets for recyclable materials and recycled products, and the ineffectiveness of the State's lead agency responsible for solid waste management. As a result of California's circumstances, the State is rapidly running out of landfill space, natural resources are depleted unnecessarily, the State will ultimately pay substantially higher costs for disposing of its waste, the environment and public health are threatened in some areas, and California is without a lead agency that can effectively address the State's solid waste problems.

Recommendations

1. To ensure that California adopts an integrated system for managing its solid waste, the Governor and the Legislature should enact legislation that explicitly establishes a statewide program that is based on a hierarchy in which source reduction is the first priority, recycling and composting are the second priority, environmentally safe incineration is the third priority, and environmentally safe landfill disposal is the fourth and last priority.

2. To curb the increased solid waste generation that results from the public's throwaway mentality, the Governor and the Legislature should require counties to establish solid waste programs that institute, where possible, systems for collecting garbage fees on a "per can" or "per bag" basis, and garbage collection billing systems that segregate garbage fees from fees for other county billings. Further, the State's lead agency on solid waste management should establish an aggressive education campaign aimed at teaching consumers the values of conservation and efficient use of resources.

3. To establish a comprehensive statewide recycling program, the Governor and the Legislature should enact legislation that requires local governments to prepare, adopt and implement plans that would divert from landfills through source reduction and recycling 25 percent of the waste generated within the jurisdiction of the local agencies. Further, the local plans should also attempt to

specifically divert household hazardous wastes from landfills. Finally, the legislation should allow the local agencies to impose fees on the generators of waste to pay the costs of preparing, adopting and implementing the plans. These should include, but not be limited to, fees based on the amount of waste disposed of in landfills.

4. To identify the long-term financial benefits and burdens of recycling, the State's lead agency for solid waste management should conduct a study to determine the costs avoided by increasing recycling. The study should include, but not be limited to, the diminished increase in landfill costs that will result from diverting solid waste from landfills, the reduction in natural resource depletion through increased conservation, and the avoidance of costs associated with reparation for damages to human health and the environment. The study should also show how recycling can be increased through mandating the purchase of recycled materials by state and local governments and through the incentive of state tax credits. If consistent with the study, the Governor and the Legislature should enact legislation requiring state and local governments to purchase specified amounts of various recycled products. Further, the legislation should provide for tax credits equal to a specified percentage of the amount paid for recyclable materials generated in California, and tax credits associated with the purchase price of qualified machinery or equipment used to manufacture finished products composed of a specified amount of waste material.

5. To establish an effective, credible lead agency on solid waste management, the Governor and the Legislature should enact legislation that requires the State's lead agency to exist as an independent five-member board. Three members of the board should be appointed by the Governor, one member should be appointed by the Senate Committee on Rules, and one member should be appointed by the Speaker of the Assembly. The board should consist of members who collectively have the following credentials:

   - Previous service as an elected local government official with demonstrated expertise in solid waste management and recycling;

   - A registered civil engineer who has specialized education and experience in solid waste management and in the design, operation, and evaluation of solid waste landfills;

   - A representative of the public who should have experience in resource conservation and environmental protection;

- An attorney admitted to the practice of law in California who has demonstrated expertise in solid waste management and recycling; and

- A representative of a nonprofit environmental or public interest organization who has demonstrated expertise in solid waste management and recycling.

In addition to existing laws related to conflict of interest as it concerns the State's lead agency, the board should be subject to the following controls:

- No member of the board could receive from solid waste companies more than 10 percent of his or her income in the two years preceding the member's appointment to the board;

- All actions taken by the board should appear in transcripts of the board's meetings, and the voting records of each of the board members should be specified in the transcripts;

- Ex parte communications by anyone appearing before the board in a quasi-judicial matter would be prohibited.

- Board members and board staff would be prohibited from working on anything affected by the actions of the board for one year after the members' or staff's departure from the board.

APPENDIX

STATE OF CALIFORNIA REMAINING DISPOSAL CAPACITY (IN TONS)*

County	DEC. 1984	DEC. 1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
ALAMEDA	56200000	59500000	57056800	54569622	52037676	49460154	46836237	44175584	41477683	38742011	35968040	33155233
ALPINE	0	0	0	0	0	0	0	0	0	0	0	0
AMADOR	540000	512000	491640	470914	449814	428335	406469	384297	361814	339017	315900	292460
BUTTE	3600000	3340000	3212750	3083210	2951337	2817091	2680429	2541853	2401338	2258855	2114377	1967877
CALAVERAS	67000	28000	10185	-7951	-26413	-45207	-64340	-83741	-103413	-123360	-143587	-164097
COLUSA	240000	214000	194658	174968	154923	134518	113745	92682	71323	49666	27705	5437
CONTRA COSTA	5490000	4100000	3218000	2303962	1373472	426233	-538057	-1515847	-2507325	-3512825	-4532119	-5565826
DEL NORTE	50600	31000	21024	10868	529	-9996	-20710	-31575	-42591	-53762	-65089	-76574
EL DORADO	620000	575000	533262	490773	447519	403486	358661	313208	267119	220384	172996	124944
FRESNO	1150000	8440000	7880100	7310122	6729884	6139202	5537888	4928155	4309886	3682961	3047259	2402658
GLENN	306000	280000	260658	240968	220923	200518	179745	158682	137323	115666	93705	71437
HUMBOLDT	1170000	1030000	957722	884143	809240	732988	655364	576653	496840	415910	333846	250634
IMPERIAL	2280000	2080000	1979218	1876622	1772179	1665856	1557620	1447868	1336579	1223733	1109327	993278
INYO	1080000	1041000	1020538	999708	978503	956916	934941	912658	890063	867152	843920	820363
KERN	7850000	7365000	6662580	5947516	5219582	4478544	3724168	2959231	2183584	1397078	599562	-209120
KINGS	922000	732000	640380	547111	452163	355506	257109	157334	56163	-46425	-150448	-255929
LAKE	2600000	2400000	2304308	2208894	2107726	2006773	1904003	1799794	1694126	1586979	1478332	1368163
LASSEN	176000	148000	128658	108968	88923	68518	47745	26682	5323	-16334	-38295	-60563
LOS ANGELES	114000000	106100000	91746200	82134032	67258344	52115903	36700390	21069059	5218889	-10853183	-27750264	-43675304
MADERA	305000	155000	78650	926	-78198	-158745	-240743	-323888	-408197	-493687	-580374	-668274
MARIN	3210000	2800000	2580112	2356266	2128391	1896414	1660261	1420803	1177991	931731	682124	428971
MARIPOSA	504000	480000	468000	455564	442904	430017	416897	403594	390104	376426	362556	348492
MENDOCINO	900000	836000	803424	770262	736502	702135	667150	631674	595702	559227	522241	484736
MERCED	2596000	2310000	2164426	2016232	1865370	1711792	1555451	1396920	1236170	1073170	907887	740291
MODOC	136000	218000	211383	204547	197790	190809	183702	176496	169190	161780	154268	146650
MONO	490000	472000	462838	453511	444016	434351	424511	414533	404416	394158	383755	373207
MONTEREY	18400000	17600000	17043244	16486556	15914758	15332668	14740100	14139236	13529960	12912154	12285699	11650474
NAPA	2850000	2500000	2316760	2130222	1940326	1747012	1550218	1350669	1148326	943151	735103	524143
NEVADA	584000	496000	451819	406843	361057	314446	266997	218884	170097	120627	70464	19599
ORANGE	44000000	36950000	36336100	32657150	28911978	25099394	21218183	17282635	13291990	9245475	5142309	981699
PLACER	8600000	8380000	8301614	8921817	8840584	8757888	8673704	8588342	8501784	8414015	8325016	8234772
PLUMAS	137000	117000	106820	96457	85907	75167	64234	53148	41907	30503	18950	7230
RIVERSIDE	50000000	53680000	52427860	51153181	49855559	48534579	47189821	45826237	44443563	43041531	41619871	40178307
SACRAMENTO	31268000	29768000	29000000	28147105	27278859	26394983	25495198	24582817	23657561	22719554	21768313	20803754
SAN BENITO	160000	123000	103658	83968	63923	43518	22745	1682	-19677	-41334	-63295	-85563
SAN BERNARDINO	13900000	10560000	9033000	7478514	5896047	4285096	2643148	982240	-703948	-2413743	-4147475	-5905479
SAN DIEGO	50200000	44000000	40900000	37687396	34416964	31087665	27698439	24261763	20776974	17243398	13660332	10027143
SAN FRANCISCO	0	0	0	0	0	0	0	0	0	0	0	0
SAN JOAQUIN	28400000	27500000	26999144	26489273	25970223	25441832	24903928	24358495	23805425	23244612	22675943	22099323
SAN LUIS OBISPO	4100000	3680000	3466220	3248592	3027047	2801513	2571921	2339114	2103047	1863676	1620954	1374835
SAN MATEO	2400000	1410000	758480	895233	220047	-467292	-1167003	-1876510	-2595951	-3325463	-4065189	-4815271
SANTA BARBARA	7770000	6940000	6518548	6089510	5652749	5208127	4755501	4296538	3831150	3359247	2880737	2395523
SANTA CLARA	52300000	52100000	50654440	49782860	48284791	46759758	45207275	43633054	42036796	40418190	38776924	37112680
SANTA CRUZ	1470000	3600000	3419814	3236385	3049654	2859561	2666047	2469824	2270854	2069078	1864518	1657073
SHASTA	8320000	8073000	7949822	7824427	7696774	7566824	7434535	7300394	7164375	7026451	6886597	6744785
SIERRA	32000	27000	24455	21864	19227	16542	13809	11037	8227	5377	2488	-442
SISKIYOU	523000	472500	447500	421592	395217	368368	341036	313321	285218	256721	227825	198525
SOLANO	6700000	16400000	16122086	15839170	15551161	15257967	14959497	14656848	14349961	14038779	13723240	13403283
SONOMA	3100000	2500000	2113160	1719357	1318465	910358	494904	73634	-355333	-786682	-1225594	-1671255
STANISLAUS	3000000	2310000	1940466	6918280	6535323	6145473	5748605	5346182	4938124	4524354	4104791	3679354
SUTTER-YUBA	1800000	1600000	1498200	1394568	1289070	1181673	1072343	961483	849070	735084	619502	502301
TEHAMA	1040000	988000	962550	936642	910267	883418	856086	828371	800268	771771	742875	713575
TRINITY	130000	121000	115197	109290	103277	97155	90924	84605	78197	71700	65112	58431
TULARE	11575000	11033000	10757122	10476278	10190379	9899334	9603050	9302618	8997980	8689077	8373850	8052237
TUOLUMNE	300000	218000	176058	133362	89897	45649	605	-45069	-91383	-138345	-185965	-234252
VENTURA	6060000	4638000	3921328	3191756	2449052	1692973	923296	142838	-648546	-1451010	-2264703	-3089798
YOLO	5600000	5182000	4839834	4592409	4289630	3981402	3667625	3349455	3026831	2699691	2367970	2031605
yuba: see sutter												
STATE WIDE TOTALS	571201600	558153500	523847813	498179909	459371811	419865167	379647404	338266592	297514349	255534181	213066434	169953539

*All figures are estimates based on the county solid waste management plans most recently submitted by the counties as of January 1, 1989. Therefore, the figures may not accurately reflect the counties' actual current disposal capacity. For example, Calaveras County shows as having exceeded its capacity in 1988 even though it actually had remaining capacity at the time of this report.

Source: California Waste Management Board

ENDNOTES

1. James Cook, "Not In Anybody's Backyard", in "Forbes" magazine, November 28, 1988, p. 173.

2. Based on estimates appearing in a December 2, 1988 Discussion Draft Working Paper of the Senate Task Force on Waste Management, and testimony by Assemblymember Delaine Eastin, given at the Little Hoover Commission's hearing on solid waste management, October 28, 1988.

3. Based on figures from a draft report of the U.S. Environmental Protection Agency (EPA), Office of Solid Waste, The Solid Waste Dilemma: An Agenda for Action, September 1988.

4. Testimony by George Eowan, Chief Executive Officer of the California Waste Management Board, given at the California Assembly Natural Resources Committee interim hearing on solid waste management and statewide recycling programs, November 18, 1987.

5. Senate Task Force, Discussion Draft Working Paper, December 2, 1988, p. 1.

6. EPA, Solid Waste Dilemma, p. 6.

7. Ibid., p. 12.

8. Ibid., p. 7.

9. California Assembly Office of Research (AOR), Integrated Solid Waste Management: Putting A Lid on Garbage Overload, p. 5.

10. EPA, Solid Waste Dilemma, p. 17

11. Ibid., pp. 17-18.

12. AOR, Putting A Lid on Garbage Overload, p. 50; and EPA, Solid Waste Dilemma, pp. 18-20.

13. EPA, Solid Waste Dilemma, p. 19.

14. Ibid., pp. 19-20.

15. Ibid., p. 20.

16. Testimony by George Eowan, CEO of the CWMB, 11/17/87.

17. CWMB, A Comprehensive Plan for Management of Nonhazardous Waste in California, June 1985, p. 15.

18. AOR, Putting A Lid on Garbage Overload, p. 26.

19. Ibid., p. 16.

20. Ibid., p. 27.

21. Ibid., p. 27.

22. EPA, Solid Waste Dilemma, p. 6.

23. AOR, Putting A Lid on Garbage Overload, p. 32.

24. Robert Hanley, New York Times, appeared in the Sacramento Bee, November 25, 1988.

25. AOR, Putting A Lid on Garbage Overload, p. 15.

26. Cook, in Forbes, 11/28/88, p. 173.

27. Ibid., p. 172.

28. CWMB, Comprehensive Plan, p. 24.

29. Sacramento Bee newspaper, February 10, 1988, p. B1.

30. AOR, Putting A Lid on Garbage Overload, p. 21.

31. Sarah Glazer, "Garbage Crisis" in Congressional Quarterly's Editorial Research Reports, Washington, D.C.: Congressional Quarterly Inc., September 11, 1987, vol. 2, no. 10, p. 474.

32. W.L. Rathje and D.C. Wilson, Characterization of Household Hazardous Waste From Marin County, California, and New Orleans, Louisiana, Las Vegas, Nevada: U.S. Environmental Protection Agency, July 1987, p. 1.

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37. Ibid., pp. 37-46 and AOR, Putting A Lid on Garbage Overload, pp. B-9 through B-13.

38. Testimony of John Gallagher, Chairman of the CWMB, submitted to the Little Hoover Commission for its hearing on solid waste management, November 18, 1988.

39. Testimony given by Richard Gertman, Recycling Program Coordinator for the City of San Jose, at the California Assembly Natural Resources Committee interim hearing on solid waste management and statewide recycling programs, November 18, 1987, and AOR, Putting A Lid on Garbage Overload, pp. B-5,6.

40. Testimony by Joe Garbarino, President of the Marin Recycling and Resource Recovery Association, at the Little Hoover Commission's hearing on solid waste management, October 28, 1988.

41. AOR, Putting A Lid on Garbage Overload, p. B-3.

42. Testimony by Assemblymember Dominic Cortese, given at the Little Hoover Commission's hearing on solid waste management, October 28, 1988.

43. Testimony by Assemblymember Delaine Eastin, given at the Little Hoover Commission's hearing on solid waste management, October 28, 1989.

44. California Government Code Section 66786.8.

45. Testimony by Robert Conheim, General Counsel for the CWMB, at the Little Hoover Commission's hearing on solid waste management, November 18, 1988.

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47. Jennifer Gitlitz and Paul Relis, synopsis of the conference "Recycling Markets: California and the Pacific Rim," which was cosponsored by the Community Environmental Council, Inc. and the CWMB, March 1988, p. 8.