

**Town of  
Los Altos Hills**

**Source  
Reduction  
and  
Recycling  
Element**

**October 1994  
Final**



# Source Reduction and Recycling Element Table of Contents

## Executive Summary

Introduction.....	ES.1
Goals of SRRE.....	ES.2
Goals for the Town of Los Altos Hills.....	ES.2
Solid Waste and Diversion Efforts in Los Altos Hills.....	ES.3
Mandated Format of SRRE.....	ES.3
Waste Generation Study.....	ES.4
Selected Programs.....	ES.4
Conclusion.....	ES.7

## I. Waste Characterization Component

Introduction.....	I-1
Demographic Information.....	I-2
Waste Disposal Study.....	I-2
Solid Waste Diversion Characteriaztion.....	I-4

## II. Source Reduction Component

Introduction.....	II-1
Objectives.....	II-4
Existing Conditions.....	II-5
National Efforts.....	II-6
Evaluation of Alternatives.....	II-7
Selection of Program.....	II-22
Program Implementation.....	II-24
Monitoring and Evaluation.....	II-25

## III. Recycling Component

Introduction.....	III-1
Objectives.....	III-1
Existing Conditions.....	III-3
Evaluation of Alternatives.....	III-4
Selection of Program.....	III-19
Program Implementation.....	III-27
Monitoring and Evaluation.....	III-29

IV.	Composting Component	IV-1
	Introduction.....	IV-2
	Objectives.....	IV-3
	Existing Conditions.....	IV-4
	Program Alternatives.....	IV-8
	Evaluation of Alternatives.....	IV-15
	Program Selection.....	IV-17
	Program Implementation.....	IV-19
	Monitoring and Evaluation.....	
V.	Special Waste Component	V-1
	Introduction.....	V-4
	Objectives.....	V-5
	Existing Conditions.....	V-7
	Evaluation of Alternatives.....	V-14
	Selection of Program.....	V-16
	Program Implementation.....	V-16
	Monitoring and Evaluation.....	
VI.	Education and Public Information Component	VI-1
	Introduction.....	VI-1
	Goals and Objectives.....	VI-2
	Existing Conditions.....	VI-3
	Program Alternatives.....	VI-9
	Program Selection.....	VI-10
	Cost of Program .....	VI-10
	Program Implementation.....	VI-11
	Monitoring and Evaluation.....	VI-12
	Monitoring Shortfalls.....	
VII.	Solid Waste Facility Component	VII-1
	Introduction.....	VII-2
	Existing Disposal Facilities.....	VII-5
	Disposal Facility Needs Projections.....	
VIII.	Funding Component	VIII-1
	Introduction.....	VIII-1
	Current Funding Sources.....	VIII-2
	Estimated Cost of Selected Programs.....	VIII-2
	Revenue Sources for Selected Programs.....	VIII-4
	Contingency Funding Source.....	

IX. Program Integration

Introduction.....IX-1  
Integrated Schedule.....IX-3

Appendix A  
Evaluation of Alternatives

Appendix B  
Waste Diversion Surveys

Appendix C  
Waste Characterization Study

## Tables and Figures

### Executive Summary

<b>Figure ES.1</b> Disposed Waste by Generator.....	ES.8
<b>Figure ES.2</b> Disposed Waste Categories by Generator.....	ES.8
<b>Tables ES.1</b> Summary of Wastes Generated through Diversion and Disposal.....	ES.9
<b>Table ES.2</b> Results of Annual Program Cost Estimates through 1995.....	ES.10

### Waste Characterization Component

<b>Figure 1.1</b> Disposed Waste by Generator.....	I-13
<b>Figure 1.2</b> Disposed Waste Categories by Generator.....	I-13
<b>Table 1.1</b> Disposed Waste Characterization Study for Los Altos Hills.....	I-14
<b>Table 1.2</b> Projected Annual Quantities of Disposed Waste.....	I-15
<b>Table 1.3</b> Diversion by Waste Type.....	I-16
<b>Table 1.4 A</b> Projected Annual Quantities of Disposed, Diverted and Generated Waste Assuming Continuation of Current Programs	I-17
<b>Table 1.4B</b> Projected Annual Quantities of Disposed, Diverted and Generated Waste Assuming Continuation of Current Programs and Implementation of the SRRE	I-20
<b>Table 1.5 A</b> Projection of Disposed and Diverted Waste Quantities Assuming Continuation of Current Programs	I-21
<b>Table 1.5 B</b> Projection of Disposed and Diverted Waste Quantities Assuming Continuation of Current Programs and Implementation of the SRRE	I-21

**Table 1.6**  
1991 Disposal, Diversion, and Generation Rates (Existing Conditions).....I-22

## **Source Reduction Component**

**Figure 2.1**  
Typical Examples of Decreased Consumption and Material Reuse.....II-3

**Table 2.1**  
Source Reduction Component Evaluation of Alternatives.....Appendix C

**Table 2.2**  
Source Reduction Component Implementation Plan.....II-24

## **Recycling Component**

**Table 3.1**  
Diversion by Waste Type.....III-34

**Table 3.2**  
Recycling Component Evaluation of Alternatives.....Appendix C

**Table 3.3**  
Recycling Component Implementation Plan.....III-27

**Table 3.4**  
Recycling Implementation Costs.....III-29

## **Composting Component**

**Table 4.1**  
Composting Component Evaluation of Alternatives.....Appendix C

**Table 4.2**  
Composting Component Implementation Plan.....IV-18

## **Special Waste Component**

**Table 5.1**  
Existing Diversion Rates for Special Wastes.....V-5

**Table 5.2**  
Special Waste Component Evaluation of Alternatives.....Appendix C

**Table 5.3**  
Special Waste Component Implementation Plan.....V-18

**Table 5.4**  
Short and Medium Term Program Costs and Funding.....V-19

**Public Education and Information Component**

**Table 6.1**  
Public Education and Information Implementation Plan.....VI-13

**Disposal Facility Capacity**

**Table 7.1**  
Solid Waste Disposal Facility Needs Projection.....VII-7

**Funding Component**

**Table 8.1**  
Estimated capital and operating costs short-term planning period.....VIII-6

-6

**Integration Component**

**Table 9.1**  
SRRE Implementation Schedule.....IX-4

# **Town of Los Altos Hills Source Reduction and Recycling Element**

## **EXECUTIVE SUMMARY**

### **Introduction**

In September 1989, the California House and Senate passed Assembly Bill (AB) 939, the California Integrated Waste Management Act of 1989. This legislation was drafted in an effort to divert materials from landfills in order to preserve decreasing landfill capacity and natural resources. AB 939 mandates that by January 1, 1995, each California city and county must divert 25 percent of all solid waste from landfill or transformation facilities through source reduction, recycling and composting activities. By January 1, 2000, the required diversion rate is 50 percent.

AB 939 and related legislation require each City to prepare, adopt, and submit to the county a Source Reduction and Recycling Element (SRRE) that addresses the following components:

- Waste Generation Study
- Source Reduction
- Recycling
- Composting
- Solid Waste Facility Capacity
- Public Education and Information
- Program Funding
- Special Waste
- Program Integration

Additionally, the Town must prepare, adopt and submit a household hazardous waste (HHW) element as a separate document.

AB 939 establishes a hierarchy of waste management practices to reach 1995 and 2000 goals:

- Source reduction to reduce generation of wastes
- Recycling and composting of materials
- Environmental safe transformation (incineration, pyrolysis, biological conversion)
- Environmentally safe land disposal

## **SRRE Goals for the Town of Los Altos Hills**

The principal solid waste management goal for the Town of Los Altos Hills is to meet the AB 939 mandated waste diversion rates of 25 percent by 1995 and 50 percent by 2000. All other goals defined throughout this document are derived in one respect or another from this principal goal. In addition, the Town hopes to achieve the specified reduction levels in the most efficient and environmentally beneficial manner possible. Furthermore, if recycling, reduction and composting efforts prove effective, and the Town can afford improved or innovative programs, it would not be unreasonable for the Town of Los Altos Hills to strive independently for higher diversion rates than those specified by AB 939.

The following specific goals have been targeted for the Town of Los Altos Hills in order to help the Town realize the more general waste diversion goals specified above.

### **Goals for the Town of Los Altos Hills' SRRE**

1. Support regional solutions and efforts to solid waste management problems.
2. Maximize recycling and composting opportunities and efforts within the Town of Los Altos Hills.
3. Minimize adverse environmental impacts and related health problems from solid waste management, collection and disposal.
4. Maximize citizen participation levels in all aspects of the Town's solid waste reduction plan.
5. Support state and regional efforts to promote source reduction and the use of recycled materials in the production process.
6. Educate and inform citizens of Los Altos Hills about both the need for and means to waste reduction.

While this list defines some of the more important goals developed throughout this SRRE, other complementary goals and objectives are also discussed in this document.

## **Solid Waste and Diversion Efforts in Los Altos Hills**

Los Altos Hills is a small, rural, residential community. There are no significant commercial or industrial businesses within the Town limits. Several schools account for the only non-residential activities within the community.

Consequently, all solid waste in the community originates from residential and institutional entities. With the exception of Foothill College, residential and institutional accounts are handled similarly.

Total Los Altos Hills disposal tonnage is estimated at 6246 for 1991. Fifty percent (3131 tons) of this waste derives from day-to-day residential and commercial/institutional practices. The other forty-nine percent (3079 tons) is categorized as industrial waste (waste hauled via a debris box) which is comprised of debris from residential, institutional and Town oriented construction operations. The remaining tonnage (36 tons) comes from self-haul loads which comprise less than one percent of the waste stream.

In July, 1990, in an effort to meet AB 939 goals as well as to improve local and regional environmental quality, Los Altos Hills implemented a "canside" recycling program. This program differs from curbside programs in that recyclables are collected from the same point as residential trash cans. In September of 1990, a yard-waste drop-off site was also opened for residents of Los Altos Hills. Residents can bring their yard-waste to a drop-off area from which it is taken to Zanker Road Landfill, where it is composted.

Construction debris is also recycled when feasible. Debris boxes from construction sites are taken to Zanker Road Landfill when contents such as construction and demolition debris are suitable for recycling.

### **Mandated Format of SRRE**

Title 14, Chapter 9 of the California Code of Regulations (CCR) specifies the required substance and format of the SRRE to be prepared by each city and county in California. The components of the SRRE that address source reduction, recycling, composting and special waste must contain the following sections:

- objectives
- existing conditions
- evaluation of alternatives
- program implementation
- monitoring and evaluation

The regulations dictate that the alternatives considered for these four components must be evaluated in accordance with the criteria that reflect a wide range of technical, economic, institutional, and socio-political issues.

The remaining components of the town's SRRE (education/public information, solid waste capacity, funding, integration) deviate somewhat in format from the first four. The apparent lack of consistency in the format is dictated by the regulations for Planning Guidelines and Procedures for Preparing and Revising Countywide Integrated Waste Management Plan (Title 14, CCR, Division 7, Chapter 9, Articles 3, 6.1, 6.2, 7 and 8).

## Waste Generation Study

In compliance with AB 939, the Town of Los Altos Hills has identified quantities of solid waste that are currently being diverted or have the potential of being diverted from the Newby Island Landfill in San Jose. In addition, the Town identified the composition and quantity of solid wastes disposed of in the landfill.

The Town of Los Altos Hills conducted a waste diversion study to estimate the quantities of materials diverted from the landfill. Diversion results were obtained from 1) town records, 2) collectors of recyclables, and 3) surveying local businesses on their diversion activities.

Summaries of the town's disposed waste stream by generator and composition of disposed waste generated are shown in Figure ES.1 and ES.2 respectively at the end of the Executive Summary. Table ES.1 located at the end of the Executive Summary is a summary of wastes generated through diversion and disposal.

### Materials Targeted for Diversion

Programs identified in the SRRE for source reduction, recycling and composting have been chosen to target these materials for diversion from landfilling:

- paper
- plastic
- other organics
- metals
- glass
- special wastes
- yard waste
- inert solids and construction/ demolition debris (soil, asphalt, concrete and wood waste)

### Selected Programs

Based on the Town of Los Altos Hills' current waste generation profile, the diversion programs selected to meet required solid waste reduction goals of 25 percent by 1995 (short-term planning period) and 50 percent by 2000 (medium-term planning period) are summarized below.

#### Source Reduction

Source Reduction is defined in AB 939 as "any action which causes a net reduction in the generation of solid waste."

#### Short-Term Planning Period

- Variable rate structure
- Public education
- Continue Town non-procurement program

- Review technical assistance to institutions and consumers
- Review possible regulatory programs (procurement/purchase preferences)
- Encourage at-home (backyard) composting

### **Medium-Term Planning Period**

- Continue and if needed modify short-term programs
- Review possible programs to establish land use requirements that promote source reduction planning
- Monitor efforts at the state level to encourage source reduction, including advance disposal fees, public education efforts and other programs

## **Recycling**

Recycling is defined in AB 939 as "the process of collecting, sorting, cleansing, treating and reconstituting materials that would otherwise become solid waste and returning them to the economic mainstream in the form of raw materials for new, reused or reconstituted products which meet the quality standards necessary to be used in the marketplace."

### **Short-Term Planning Period**

- Continue a residential curbside collection program for recyclables
- Review possible program to divert inert solids and construction/demolition debris (i.e. wood waste) generated from public works and construction/demolition projects
- Review possible program of regulatory approaches such as zoning to promote recycling activities
- Examine options for market development
- Continue a variable rate structure for residential collection
- Continue any multi-jurisdictional approaches to recycling such as public education, disposal fees and market development

### **Medium-Term Planning Period**

- Implement customer and hauler incentives to insure that debris boxes containing inert wastes are clean enough for recovery

## **Composting**

Composting can be defined as the biological degradation of organic matter under controlled conditions to produce a usable soil amendment.

### **Short-Term Planning Period**

- Continue residential yard waste drop off program
- Examine possibility of developing a regional compost processing facility
- Improve public awareness of marketing program for distribution of end-products
- Disseminate public education materials regarding drop off program and other yard waste reduction strategies
- Evaluate possibility for curbside or backyard collection of yard waste

### **Medium-Term Planning Period**

- Continue residential yard waste drop off program, unless a better alternative is found
- Consider better alternative to yard waste drop off program
- Pursue curbside or canside collection of yard waste if it proves efficient
- Study the feasibility of co-composting yard waste with other organic residues including sewage sludge

## **Special Wastes**

Special waste is solid waste that requires unique handling and disposal methods because of health hazard, environmental impact, or physical characterizations. Examples of special wastes are; sewage sludge, ash, asbestos, tires, white goods, mattresses, abandoned vehicles and dead animals. Many of the special wastes generated in Los Altos Hills are currently being diverted into recycling channels. Other special wastes however are not countable toward diversion. Should white goods no longer be counted toward diversion (as is anticipated by recent legislation) the Town will still meet its waste reduction goals.

## **Education and Public Information**

Public information and educational programs are vital to the success of meeting solid waste reduction goals. The Town of Los Altos Hills will continue to target sectors to increase participation in existing and new waste reduction efforts. The

entire community will be informed about expansion/modifications and new programs.

## **Solid Waste Facility Capacity**

There are no permitted solid waste disposal facilities within the Town of Los Altos Hills. All of the Town's disposed waste (with the exception of less than one percent self-hauled) is currently hauled to the permitted Newby Island Landfill in San Jose. There are no plans to establish a disposal facility in the Town of Los Altos Hills during the short or medium-term planning periods.

Based on disposal needs projections, the Town will not require additional disposal capacity from any other landfill during the 15 year planning period.

## **Funding**

Solid waste management programs in the Town of Los Altos Hills are funded by the Solid Waste Fund. Revenues for this fund include fees levied through garbage rates. Franchise fees for refuse collection by Los Altos Garbage Company go into the General Fund. Surcharges and fees are adjusted regularly based on projected costs. The recycling program is funded through regular customer rates.

The source of funding for future programs during the short term period will be the Town's Solid Waste Fund. Results of annual program cost estimates through 1995 are presented in Table ES.2 at the end of the Executive Summary.

## **Integration**

All solid waste programs selected by the Town of Los Altos Hills will be integrated to promote source reduction, recycling, and composting and environmentally safe transformation and disposal. A combination of existing programs with new programs and activities supported by aggressive public awareness will contribute to the Town meeting diversion targets mandated by law.

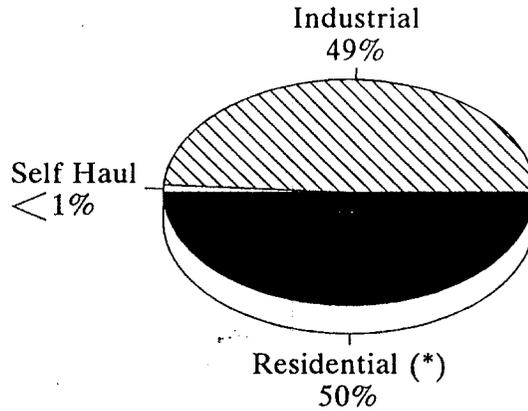
## **Conclusion**

Currently Los Altos Hills is diverting 28 percent (2433 tons) of its solid waste generated. The Town of Los Altos Hills can expect to divert 35.5 percent (3116 tons) of its waste stream by 1995. By 2000, the Town expects to divert 50.7 percent (4591 tons) of its generated waste.



Figure ES.1

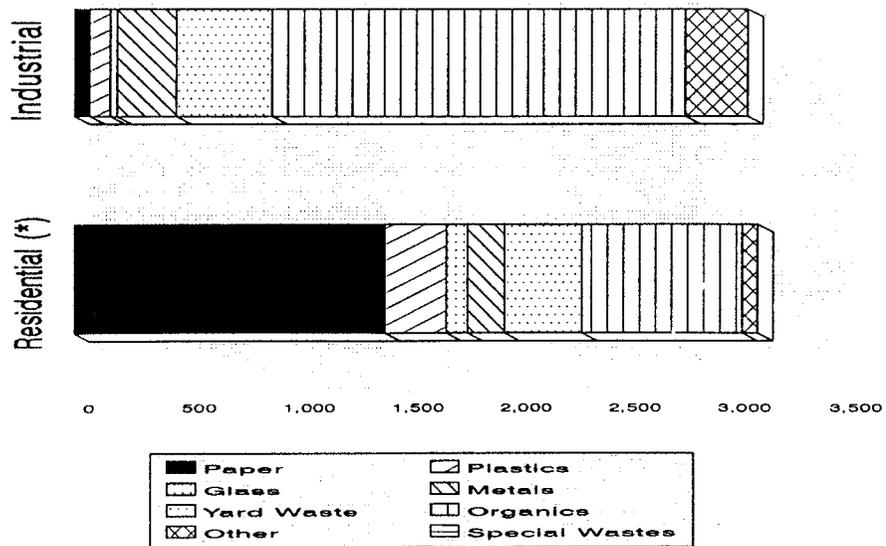
### Disposed Waste in Percent of Weight by Generator



(\*) Commercial Waste is included in Residential

Figure ES.2

### Disposed Waste Categories by Generator



Since self-haul waste accounts for only 1%, it is not included in this graph.

(\*) Commercial Waste is included in residential

Table ES.1

Quantities and Percentages of Waste Diverted  
from the Town's Waste Stream

Waste Source	Quantities Generated Tons/Year (1991)	Quantities Diverted Tons/Year (1991)	Percent Diversion
Residential - includes Commercial	5564	2433	44%
Self Haul	36	N/A	LESS THAN 1%
Industrial	3079	N/A	N/A
TOTAL	8679	2433	28%

Table ES.2

Town of Los Altos Hills Annual Costs, 1991-1995

COMPONENT	ESTIMATED ANNUAL COST	TOWN COST
Source Reduction	\$0 - \$5,000	\$0 - \$5,000
Recycling	\$150,000	\$2,000
Composting	\$30-50,000	\$0 - \$20,000
Public Education	\$6,500	\$4,000
Special Waste	\$12,500 - \$22,500	\$2,500 - \$17,500
TOTAL	\$199,000 - \$234,000	\$8,500 - \$48,500



# WASTE CHARACTERIZATION STUDY

## Introduction

This section presents the results of a waste disposal and diversion characterization study performed for the Town of Los Altos Hills. The waste characterization was conducted to satisfy the requirements of an AB 939 initial study. As required by AB 939, the study was divided into two parts: a waste disposal characterization and a waste diversion characterization. When combined, the results of the disposal and diversion characterizations yield the total amount of solid waste generated in Los Altos Hills according to the equation defined by AB 939.

$$\text{Generation} = \text{Disposal} + \text{Diversion}$$

**Generation:** the total quantity of solid waste generated within the jurisdiction.

**Disposal:** the total quantity of solid waste, generated within the jurisdiction, which is transformed or disposed in permitted solid waste facilities.

**Diversion:** the total quantity of solid waste, generated within the jurisdiction, which is diverted from permitted solid waste transformation and disposal facilities, through existing source reduction, recycling and composting programs.

The waste disposal characterization was performed using quantitative field methodology. Waste diversion quantities were determined using a material accounting system that collected information from the generators of diverted materials and from the collectors for those materials. When combined, the information from the two sources amounted to a comprehensive accounting of solid waste generated from the Los Altos Hills waste stream.

The waste generation study also attempted to measure the amount of source reduction occurring in Los Altos Hills. As with the diversion study, a survey technique was developed to estimate the amount of source reduction occurring with several clearly defined materials and products. Details of the source reduction, waste disposal and waste diversion studies are presented in the following sections. Using information from the waste generation study and other components of the SRRE, a 15 year projection is included for the amounts and types of waste expected to be generated under the current solid waste management conditions as well as those proposed in the SRRE.

## **Demographic Information**

The Town of Los Altos Hills is located 37 miles south of San Francisco in northwestern Santa Clara County. Neighboring jurisdictions are Palo Alto, Los Altos and unincorporated Santa Clara County. The Town is approximately 8.2 square miles in area and consists of residential and institutional land uses. The population of the Town is only 7764 residents and the minimum lot size is one acre.

## **Waste Disposal Study**

### **Objective**

The objective of the waste disposal study is to determine the quantities and characterizations of materials that are generated by the residential, commercial, industrial and self-haul segments in the Town of Los Altos Hills, and being disposed of by landfilling.

The quantities of waste generated in the Town of Los Altos Hills have been estimated based upon the results of a disposed waste characterization study conducted by Cal Recovery Inc. The sample study was conducted at the Zanker Road Landfill from June 3-12, 1991, as shown in Table 1.1 located at the end of this component. The complete study is in Appendix A. Waste composition percentages by material type derived from the waste generation study have been applied to "actual" disposed tonnage data compiled by the Los Altos Garbage Company for the study year. Actual disposed tonnage information compiled by Los Altos Garbage Company and reported to the Town for the year 1991 is more accurate than the numbers derived in the study and therefore is used as the basis of this report with the exception of self-haul tonnage. Appendix A shows the data reported by Cal Recovery and is followed by a series of revised tables and data based on actual 1991 tonnage information compiled by Los Altos Garbage Company.

### **Current Solid Waste Practices**

All of the solid waste collected by the Town's franchised hauler, Los Altos Garbage Co. (LAGCo), is disposed at Newby Island landfill. LAGCo, collects both residential and non-residential garbage, including commercial, industrial and construction/demolition wastes.

Small haulers, residents, and contractors also self-haul wastes directly to landfills. Self haul wastes generally consist of bulky items that are not suitable for collection by conventional residential and commercial methods.

There is no permitted waste disposal facility in Los Altos Hills. Most waste in the Town is destined for disposal in San Jose.

## **Sampling Methodology**

The complete Disposal Waste Characterization Study by Cal Recovery, Inc. which details methodology and results is included in Appendix A of the SRRE.

## **Disposed Waste Composition and Quantities**

Tonnages of Los Altos Hills' disposed waste are quantified from hauler (LAGCo) and landfill operator (BFI Newby Island) records. All wastes are weighed at the landfill.

Total Los Altos Hills disposal tonnage is estimated at 6246 for 1991. The pie chart in Figure 1.1 located at the end of this component, shows the percentage by weight of Los Altos Hills' total disposed waste by generator. As shown, the residential and industrial (debris boxes) sectors comprise almost the entire waste stream at 50 percent and 49 percent respectively. Figure 1.2 located at the end of this component shows the composition of disposed waste by generator.

The average compositions (percent of weight) and the estimated annual disposed quantities (in tons per year) for residential (and commercial), industrial and self-haul waste are shown in Table 1.1. The results are presented in accordance with the categories required by the California Integrated Waste Management Board.

For this study, the category labeled "Other Special Wastes" consists of common household appliances such as stereos, radios and telephones. These types of appliances predominate in compacted residential waste (i.e., waste usually collected in rear loaders) and can be readily salvaged or identified at the tipping area.

In the following sections, the results of the disposed waste characterization are discussed as they pertain to the Town of Los Altos Hills.

### **Residential Wastes**

The total paper category is the category with the largest concentration 45.2 percent (1415 tons per year) in the disposed residential waste stream. Mixed paper alone comprises approximately 24.5 percent (767 tons per year) of the Town's disposed residential waste. Yard waste comprises 11.4 percent (357 tons per year) and food waste 13.6 percent (426 tons per year) of the residential waste stream.

### **Commercial Wastes**

Commercial waste was not identified during the waste sort because no discrete commercial loads were available for sampling. The approximate 2 percent of the total disposed waste defined as commercial is presented as a part of the residential waste numbers.

## **Industrial Wastes**

There are no industrial generators located within Los Altos Hills. However, by CIWMB definition, industrial waste includes debris boxes. Industrial composition in Table 1.1 is based on debris boxes. The majority of this waste stream comes from landscaping and construction activities, as indicated by the substantial portion 76 percent (2337 tons per year) of the waste stream being organics or yard waste.

## **Self-Haul Wastes**

The quantity of self-haul wastes disposed is less than one percent (36 tons) of the total waste stream. Inert wastes comprise the majority of the self-haul waste stream at 41.5 percent (15 tons per year).

## **Seasonality**

Four seasons could impact the disposed wastes in Los Altos Hills. Yard waste is the only category expected to undergo substantial seasonal variation in disposed waste generation. The concentration could be expected to fluctuate +/- 20 percent over the course of the year. See Appendix A for further explanation.

## **Projected Disposed Waste Quantities**

Table 1-2 located at the end of this component shows the fifteen year projection of disposed waste by waste source. The projected quantities are based on population projections provided by the Town, published by the Association of Bay Area Governments (ABAG). For this table the population projections are used only to calculate the escalation rate of the disposed waste quantities.

## **Solid Waste Diversion Characterization**

### **Objective of the Study**

In accordance with Title 14, Chapter 9 of the CCR, the objective of the waste diversion characterization is to determine the quantity and types of materials that are currently being diverted from permitted solid waste disposal facilities. The diversion quantities reflect the amount of materials that are generated in the Town of Los Altos Hills and diverted from the landfill via source reduction, recycling and composting. By State law, only those materials normally disposed of at permitted solid waste landfills, representing at least 0.001 percent of the waste stream, count towards diversion. It is essential to document the existing level of waste reduction in order to determine what type of programs need to be implemented to reach state mandated diversion rates of 25 percent by 1995 and 50 percent by 2000.

## **Waste Diversion Collection and Diversion Facilities**

All of the curbside recycling materials collected by the Town's franchised hauler, Los Altos Garbage Company (LAGCo) are brought to the BFI Recyclery in San Jose. All of the yard waste collected at the drop-off site is brought to Zanker Road Landfill for composting. There is no permitted solid waste facility in the Town of Los Altos Hills.

## **Waste Diversion Flow Process**

The flow of materials diverted from the waste stream is more complex than that for materials destined for disposal at a landfill. This complexity occurs because the various materials must be separated and processed (contaminants removed, materials baled) to meet market specifications, and this is often done in facilities dedicated to one type of material. In this process, several processors may be involved between the generator and the end user. For some items, materials are taken directly to the processor from the generator, who remanufactures the materials into recycled products.

Much of the recycling in the Town of Los Altos Hills follows a similar path, flowing from the generator to a collector, who may sell the material to a dealer. In turn, the dealer processes the material before it is ultimately sold to an end user; in some cases the dealer also acts as a collector.

## **Methodology**

The solid waste diversion characterization used a multi-prong approach to document the quantity and types of materials that are diverted from disposal in the Town in 1990. Waste diversion data was obtained by the following mechanisms: (1) a mail survey of collectors and processors of recyclable materials, utilizing a direct accounting scheme where materials were accounted for from each specific jurisdiction that participated in the study; (2) a survey of Town residential and nonresidential diversion programs using a direct accounting scheme based on factual data; and (3) telephone and fax communications to clarify and supplement, whenever possible, incomplete data collected through the mail survey, as well as to obtain data from additional sources. The survey data counted only materials that could be documented and were verifiable. No adjustments were made for import and export of commodities and commodity lifetime on the basis that factual data was obtained through straight accounting.

## **Survey of Recyclers**

In order to document the quantity and types of materials that were diverted from disposal in the Town in 1990, a survey was conducted of recyclers in the area. The mailing list was developed from the following sources:

- San Jose State Center for Development of Recycling

- Santa Clara Valley Manufacturing Group's "Commercial Recycling Guide"
- Sierra Club's "Where to Recycle in Santa Clara County"
- City of Santa Clara's list of recyclers
- Telephone books

Survey forms were mailed to recyclers to determine quantities of waste diverted by material type in 1990. To promote participation in the survey, recyclers were informed that the information that they provided would be reported in aggregate form only, to ensure confidentiality. Information requested as part of the survey included:

- Business type (e.g., broker, collector, scrap metal dealer, buy-back center, etc.)
- Anticipated percentage increase (or decrease) in recycling tonnage in 1991
- Tonnage of materials collected by type for 1990
- Source of the waste (i.e. residents, commercial businesses, industry, other)
- Purchaser of recyclables (if not end user)

A copy of the survey form is presented in Appendix B. In a number of cases it was necessary to follow up the mailed survey with phone calls to obtain the requested data.

## **Review of Town Programs**

Records from collection programs in the Town of Los Altos Hills were reviewed to obtain data on the quantities of wastes diverted from the residential waste stream (and a portion of the commercial waste stream).

Residential diversion programs in the Town of Los Altos Hills include the following:

- Canside collection program
- Drop-off yard waste program
- Diversion of inerts and construction/demolition debris when contents are suitable for recycling

## **Cross Checking**

To avoid double counting, the material flow was charted for each waste type. Data obtained from collectors that reported purchasers for a waste type were eliminated from tabulation when those purchasers also reported data for that

waste type. This approach allowed material to be counted only once and quantities to be determined with the best available data.

## Data Reduction

Waste diversion data collected were tallied on a spreadsheet form; survey results for recyclers were reported in the aggregate, in compliance with the confidentiality agreement between the consultant conducting the study and the survey respondents. The following data were tallied:

- waste generator, i.e., residential or commercial/industrial
- program type, such as curbside, drop-off, buy-back or other
- quantitative estimates of materials diverted. Recyclers serving several jurisdictions were requested to provide data specific to the Town.

## Conversion Factors

Survey data reported as volumes were converted to weight using conversion factors from The National Recycling Coalition Measurement Standards and Reporting Guidelines, October 31, 1989, as shown in Appendix B. Source reduction data for diapers was calculated using a conversion factor from a document entitled *Diapers in the Waste Stream*.<sup>1</sup> Based on this study, it is estimated that there are 4,500 single use diapers per ton of garbage.

Landfill operators and recyclers also reported the following average weights of specific materials:

- |                                 |             |
|---------------------------------|-------------|
| • battery                       | 44 pounds   |
| • mattress                      | 40 pounds   |
| • laser toner cartridge (empty) | 4 pounds    |
| • 25 aluminum cans              | 1 pound     |
| • 6 PET liter bottles           | 1 pound     |
| • Christmas tree                | 19.4 pounds |
| • Telephone books               | 9 pounds    |

## Survey Response Rate

In addition to the franchised solid waste collection company servicing Los Altos Hills, a total of 138 recyclers, brokers, collectors, end users, and operators of transfer stations and landfills were surveyed as part of the Town's waste diversion characterization. Of these, 49 responded, for a response rate of 36 percent. A breakdown of the responses by category is as follows:

- 130 recyclers, brokers, collectors and end users were surveyed; 41 replied, for a response rate of 32 percent
- 8 operators of landfills and transfer stations were surveyed and all responded, for a response rate of 100 percent.

The responses to the diversion survey reflect a comprehensive reporting of solid waste transfer station and disposal facility diversion programs. Brokers and collectors, however are "underreported" because of the unwillingness of some members of the recycling sector to divulge information they consider proprietary. Specifically, metals and some paper grades are underreported in the results because of the non-cooperation of brokers and collectors in providing information on diversion of these waste materials.

## **Caveats Concerning Data**

The following should be noted in reviewing the data presented in Table 1-3 at the end of this component.

- Where necessary, the data were apportioned based upon the population ratio of those areas for which the data were reported.
- Apartment recycling is generally not reported separately from residential recycling. However, because of the different type of collection system, a column is provided for separate reporting. One advantage of keeping separate accounting for this material is that a separate public education program is often designed for apartment dwellers, and this accounting would enable tracking of the success of such a program.
- The data for landfill salvaging were placed in the commercial table. The suppliers of the data were not able to separate it out by source because of the nature of the operation.
- Data on glass tonnages from some cities were reported as commingled. According to the Department of Conservation (DOC), as of March 1, commingled glass coming from curbside programs is assumed to contain 60 percent California redemption value glass, whereas commingled glass from a certified redemption center is assumed to contain 75 percent. This percentage is based on a recent survey for DOC and thus used for this study.
- The results for tires show quantities recycled and transformed. Some tires are sent to Mexico to be recapped. Of the quantity of tires sent for transformation, 25 percent are recovered as casings and used tires before being transformed into electricity. Of the 75 percent transformed, 25 percent are recovered as by-products: gypsum, zinc, and steel. Thus, the data reported were apportioned in this manner.

## **Breakdown of Data by Program**

### **Source Reduction**

An estimated 34.1 tons (less than 1 percent) of the total waste stream was calculated as being diverted from the Los Altos Hills waste stream through source

reduction activities. This tonnage is derived from the use of re-usable cloth diapers as opposed to disposables.

### **Residential Recycling**

Based on the survey of recyclers and on the Town's recycling programs, an estimated 1107 tons of waste is diverted in the Town through the residential curbside/curbside recycling program. Table 1-3 at the end of this component provides a tonnage breakdown by material category and type collected through the residential curbside recycling program as well as other materials recycled through drop-off programs.

### **Composting**

The Town reported 1,282 tons of yard wastes collected at the drop-off site for composting in 1991. The drop-off program is the Town's primary means for composting activities, and accounts for all material collected.

### **Calculation of Diversion Rate**

Diversion by waste type for the Town of Los Altos Hills is presented in Tables 1-4A and 1-4B as percent diversion; this rate was calculated by:

- tabulating the tons/year disposed by waste type and waste generator (residential, commercial, etc.)
- tallying these quantities by waste type
- in a separate column, summing the quantity of waste diverted for each waste type
- adding up the quantities disposed and diverted to determine the total quantity in tons/year generated by waste type (disposed + diverted = total generated)
- dividing the quantity source reduced, recycled, and composted by the total generated to determine the diversion rate (source reduction + recycling + composting x 100)/total generated = diversion rate percent) for each waste type.
- Summing the data for individual waste types to obtain diversion figures for the entire Los Altos Hills waste diversion program

Tables 1-4A and 1-4B provide a 15 year projection of diversion through the year 2006 assuming continuation of the current programs and assuming continuation of the programs with implementation of the SRRE. Information provided in Tables 1-4A and 1-4B is provided by waste category and waste type.

Table 1-5A and 1-5B provide summary projections of disposed and diverted waste quantities assuming continuation of current programs and assuming continuation of current programs and implementation of the SRRE respectively.

Both Tables provide information on disposed waste by weight (tons) and volume (cubic yards). Weight to volume conversion factors are based on a 4:1 compaction ratio. The 4:1 compaction ratio has been deemed a suitable means to categorize the overall waste stream by Newby Island Landfill operators.

Table 1-6 provides 1991 waste disposal, diversion and generation rates by material category and type per each sector; residential, industrial and self-haul.

## Reporting Procedures

### Description of Data

### Information Source

Disposal - quantity of refuse disposed  
by LAGCo at the Newby Island Landfill

BFI and LAGCo

Curbside/Canside Collection  
of recyclables

LAGCo  
monthly reports

Yard Waste Drop-off Program

LAGCo  
monthly reports

## Materials Targeted for Disposal

The following categories of materials are targeted for diversion through programs identified in the source reduction, recycling, composting, and special waste components of the SRRE. Only those materials that can be counted towards the AB 939 diversion targets are shown:

### **Paper:**

corrugated containers  
mixed paper  
newspaper  
high grade ledger paper

### **Metals:**

aluminum cans  
other ferrous  
non-ferrous, incl. alum scrap  
bi-metal containers; white goods  
steel food and beverage cans

### **Plastics:**

HDPE containers  
polystyrene  
PET containers

### **Other Organics:**

yard waste  
tires/rubber  
wood wastes  
textiles/leather

### **Glass:**

CA Redemption Value  
other recyclable glass  
refillable beverage containers

### **Other Wastes:**

inert solids and construction/  
demolition waste (e.g. asphalt,  
concrete, soil and wood)

## Materials Targeted for Disposal

The following list identifies the materials that are currently being disposed of by the Town of Los Altos Hills that identified programs will not divert from disposal. The programs identified in the SRRE do not target the following list of materials because (1) the materials are non-recyclable, (2) the quantity being disposed of is insignificant, or (3) there is no market (existing or future). Only those materials that qualify as solid waste under AB 939 are shown.

**Paper:**  
other paper

**Glass:**  
other non-recyclable glass

**Plastics:**  
film plastics  
other plastics

**Other Organics:**  
food wastes

FOOTNOTES\*\*\*\*\*

<sup>1</sup>Lehrburger, Carl, *Diapers in the Waste Stream: A Review of Waste Management and Public Policy Issues*, Beaudry Communications, Washington D.C., December 1988 p.17.

Figure 1.1

Disposed Waste in Percent of Weight by Generator

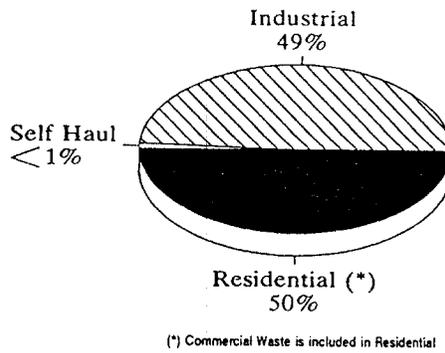
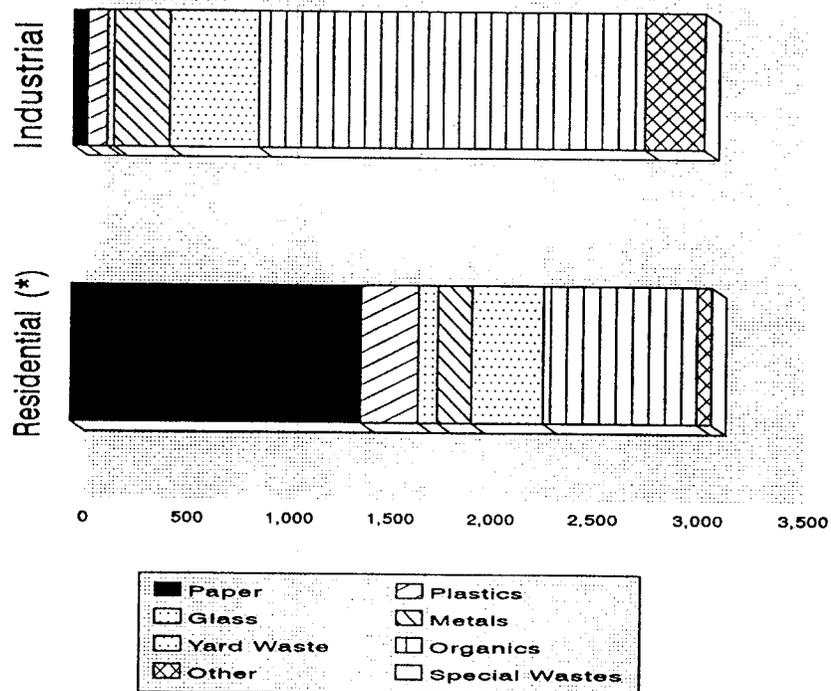


Figure 1.2

Disposed Waste Categories by Generator



Since self-haul waste accounts for less than 1%, it is not included in this graph.

(\*) Commercial Waste is included in residential

Table 1.1

## 1991 Disposed Waste Characterization

Material	Residential (b)		Industrial		Self Haul		Total Disposed	
	%	TPY	%	TPY	%	TPY	%	TPY
<b>Total Paper</b>	<b>45.2%</b>	<b>1415</b>	<b>2.2%</b>	<b>68</b>	<b>7.6%</b>	<b>3</b>	<b>23.8%</b>	<b>1486</b>
OCC/Kraft	6.6%	207	1.4%	43	3.7%	1	4.0%	251
Mixed	24.5%	767	0.5%	15	3.4%	1	12.5%	783
Newspaper	4.9%	153	0.0%	1	0.4%	1	2.5%	155
High-Grade	0.5%	16	0.0%	0	0.0%	0	0.3%	16
Other	8.7%	272	0.3%	9	0.1%	0	4.5%	281
<b>Total Plastics</b>	<b>9.0%</b>	<b>282</b>	<b>3.0%</b>	<b>92</b>	<b>3.0%</b>	<b>1</b>	<b>6.0%</b>	<b>375</b>
HDPE	1.1%	34	0.2%	6	0.0%	0	0.7%	41
PET	0.3%	9	0.0%	0	0.0%	0	0.2%	9
Film	4.0%	125	0.0%	0	1.3%	0	2.0%	126
Other	3.6%	113	2.8%	86	1.7%	1	3.2%	200
<b>Total Glass</b>	<b>3.1%</b>	<b>97</b>	<b>1.0%</b>	<b>31</b>	<b>0.6%</b>	<b>0</b>	<b>2.1%</b>	<b>129</b>
Refillable Beverage	0.1%	3	0.0%	1	0.0%	0	0.1%	4
Can Redemption	0.7%	22	0.2%	6	0.1%	0	0.5%	28
Other Recyclable	2.0%	63	0.5%	15	0.0%	0	1.2%	78
Other Non-Recyclable	0.3%	9	0.3%	9	0.5%	0	0.3%	19
<b>Total Metals</b>	<b>5.5%</b>	<b>172</b>	<b>8.7%</b>	<b>268</b>	<b>13.3%</b>	<b>5</b>	<b>7.1%</b>	<b>445</b>
Aluminum Cans	0.2%	6	0.0%	0	0.1%	0	0.1%	6
Bimetal	0.0%	0	0.0%	0	0.0%	0	0.0%	0
Tin F/B	1.4%	44	0.0%	0	0.0%	0	0.7%	44
Non-Ferrous	0.2%	6	1.4%	43	0.7%	0	0.8%	50
White Goods	0.0%	0	2.5%	77	4.2%	2	1.3%	78
Other	3.7%	116	4.8%	148	8.3%	3	4.3%	267
<b>Yard Waste</b>	<b>11.4%</b>	<b>357</b>	<b>14.2%</b>	<b>437</b>	<b>5.1%</b>	<b>2</b>	<b>12.7%</b>	<b>796</b>
<b>Other Organics</b>	<b>23.4%</b>	<b>733</b>	<b>61.7%</b>	<b>1900</b>	<b>28.5%</b>	<b>10</b>	<b>42.3%</b>	<b>2043</b>
Food	13.6%	426	0.0%	0	0.4%	0	6.8%	426
Tires/Rubber	0.9%	28	2.8%	86	0.5%	0	1.8%	115
Wood	2.1%	66	36.3%	1118	20.2%	7	19.1%	1191
Ag Crop Residue	0.0%	0	0.0%	0	0.0%	0	0.0%	0
Manure	0.0%	0	0.0%	0	0.0%	0	0.0%	0
Textile/Leather	2.8%	88	0.8%	25	6.1%	2	1.8%	114
Other Misc. Organic	4.0%	125	21.8%	671	1.4%	1	12.8%	797
<b>Other Wastes</b>	<b>2.2%</b>	<b>69</b>	<b>9.2%</b>	<b>283</b>	<b>41.5%</b>	<b>15</b>	<b>5.9%</b>	<b>366</b>
Inerts	2.1%	66	9.2%	283	41.5%	15	5.8%	364
HHW	0.1%	2	0.0%	0	0.0%	0	0.0%	2
<b>Special Wastes a)</b>	<b>0.2%</b>	<b>6</b>	<b>0.0%</b>	<b>0</b>	<b>0.4%</b>	<b>0</b>	<b>0.1%</b>	<b>6</b>
<b>TOTAL</b>	<b>100.0%</b>	<b>3131</b>	<b>100.0%</b>	<b>3079</b>	<b>100.0%</b>	<b>36</b>	<b>100.0%</b>	<b>6246</b>

a) Small Household Appliances

b) Commercial Waste included in Residential

Note: Debris box loads are categorized as "Industrial"

Note: Waste composition percentages by material type derived from Cal Recovery's Waste Generation Study have been applied to "actual" disposed tonnage information compiled by LAGCO for this table.

Table 1-2

Projected Annual Quantities of Disposed Waste for Los Altos Hills (Tons/Year)  
Existing Disposal with Current Programs

Year:	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Material Esc factor a):	1.002	1.002	1.002	1.002	1.002	1.002	1.006	1.006	1.006	1.006	1.006	1.006	1.006	1.006	1.006	1.006
1) TOTAL PAPER	1486	1489	1492	1495	1498	1501	1510	1519	1528	1537	1537	1537	1537	1537	1537	1537
OCC/Kraft	251	252	252	253	253	254	255	257	258	260	260	260	260	260	260	260
Mixed Paper	783	785	786	788	789	791	796	800	805	810	810	810	810	810	810	810
Newsprint	155	155	156	156	156	157	157	158	159	160	160	160	160	160	160	160
High Grade	16	16	16	16	16	16	16	16	16	17	17	17	17	17	17	17
Other Paper	261	262	262	263	263	264	266	267	269	291	291	291	291	291	291	291
2) TOTAL PLASTICS	375	376	377	377	378	379	381	383	386	388	388	388	388	388	388	388
HDPE	41	41	41	41	41	41	42	42	42	42	42	42	42	42	42	42
PET	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Film	126	126	127	127	127	127	128	129	130	130	130	130	130	130	130	130
Other Plastics	200	200	201	201	202	202	203	204	206	207	207	207	207	207	207	207
3) TOTAL GLASS	129	129	130	130	130	130	131	132	133	133	133	133	133	133	133	133
Recyclable Glass Dev.	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Cairl Redemption Value	28	28	28	28	28	28	28	29	29	29	29	29	29	29	29	29
Other Recyclable	78	78	78	78	79	79	79	80	80	81	81	81	81	81	81	81
Other Non Recyclable	19	19	19	19	19	19	19	19	20	20	20	20	20	20	20	20
4) TOTAL METALS	445	446	447	448	449	449	452	455	458	460	460	460	460	460	460	460
Aluminum Cans	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Bimetal Cans	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tin Pig Cans	44	44	44	44	44	44	45	45	45	46	46	46	46	46	46	46
Non FE/Other Alum	50	50	50	50	50	51	51	51	51	52	52	52	52	52	52	52
White Goods	78	78	78	78	79	79	79	80	80	81	81	81	81	81	81	81
Other Metal	267	268	268	269	269	270	271	273	275	276	276	276	276	276	276	276
5) YARD WASTES	798	798	799	801	802	804	809	814	819	823	823	823	823	823	823	823
6) OTHER ORGANICS	2643	2648	2654	2659	2664	2670	2686	2702	2718	2734	2734	2734	2734	2734	2734	2734
Food	426	427	428	429	429	430	433	435	438	441	441	441	441	441	441	441
Tires/Rubber	115	115	115	116	116	116	117	118	118	119	119	119	119	119	119	119
Wood	1191	1183	1198	1198	1201	1203	1210	1217	1225	1232	1232	1232	1232	1232	1232	1232
Ag Crop Residue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Manure	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Textiles/leather	114	114	114	115	115	115	116	117	117	118	118	118	118	118	118	118
Other Misc Organics	797	799	800	802	803	805	810	815	820	824	824	824	824	824	824	824
7) OTHER WASTES	366	367	367	368	368	370	372	374	376	379	379	379	379	379	379	379
Inert Solids	364	365	365	366	367	368	370	372	374	377	377	377	377	377	377	377
HHW	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
8) OTHER SPECIAL WASTES b)	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
TOTAL	6246	6258	6271	6284	6296	6309	6347	6385	6423	6461	6461	6461	6461	6461	6461	6461

a) Escalation factor (Esc factor) is based on projected population data as reported by ABAG  
b) Small Household Appliances

Note: Total may not sum exactly due to rounding

Note: Disposal tonnages in Table 1-2 will differ from disposed tonnages found in other tables due to subsequent tables generation numbers are projected using Esc factor as opposed to the disposed tonnage.

DIVERSION QUANTITIES  
(TONS, 1991)

	SOURCE REDUCTION	CURBSIDE	APARTMENT RECYCLING	DROP-OFF	BUY-BACK	20/20 CENTERS	COMPOSTING	TOTAL WITHOUT TRANSFORMATION	TRANSFORMATION	TOTAL WITH TRANSFORMATION	PERCENT DIVERTED
<b>PAPER</b>	0.0	560.0	0.0	0.0	0.0	0.0	0.0	560.0	0.0	560.0	23.0%
corrugated containers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
newsprint	0.0	435.0	0.0	0.0	0.0	0.0	0.0	435.0	0.0	435.0	17.9%
high grade ledger paper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
mixed paper	0.0	125.0	0.0	0.0	0.0	0.0	0.0	125.0	0.0	125.0	5.1%
other paper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
<b>PLASTICS</b>	0.0	32.8	0.0	0.0	0.0	0.0	0.0	32.8	0.0	32.8	1.3%
HDPE containers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
PET containers	0.0	32.8	0.0	0.0	0.0	0.0	0.0	32.8	0.0	32.8	1.3%
film plastics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
other plastics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
<b>GLASS</b>	0.0	388.4	0.0	0.0	0.0	0.0	0.0	388.4	0.0	388.4	16.0%
refillable bev. containers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
CA Redemption Value	0.0	233.0	0.0	0.0	0.0	0.0	0.0	233.0	0.0	233.0	9.6%
other recyclable glass	0.0	155.4	0.0	0.0	0.0	0.0	0.0	155.4	0.0	155.4	6.4%
other non-recyclable glass	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
<b>METALS</b>	0.0	1282.0	0.0	7.9	0.0	0.0	0.0	1337.7	0.0	1337.7	5.5%
aluminum cans	0.0	98.5	0.0	0.0	0.0	0.0	0.0	98.5	0.0	98.5	4.0%
bi-metal containers	0.0	27.3	0.0	0.0	0.0	0.0	0.0	27.3	0.0	27.3	1.1%
tin cans	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
other ferrous	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
other aluminum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
other non-ferrous	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
white goods	0.0	0.0	0.0	7.9	0.0	0.0	0.0	7.9	0.0	7.9	0.3%
<b>YARD WASTE</b>	0.0	0.0	0.0	1282.0	0.0	0.0	0.0	1282.0	0.0	1282.0	52.7%
<b>OTHER ORGANICS</b>	34.1	0.0	0.0	0.0	0.0	0.0	0.0	34.1	0.0	34.1	1.4%
food waste	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
tires/rubber	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
wood wastes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
agricultural crop residues	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
manure	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
textiles/leather	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
diapers	34.1	0.0	0.0	0.0	0.0	0.0	0.0	34.1	0.0	34.1	1.4%
other misc. organics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
<b>OTHER WASTES</b>	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	2.0	0.1%
inert solids	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
batteries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
other HHWS	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	2.0	0.1%
<b>SPECIAL WASTES</b>	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0%
ash	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
sewage sludge	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
industrial sludge	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
asbestos	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
auto shredder waste	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
auto bodies	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
mattresses	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
a) other special waste	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0%
<b>TOTAL</b>	34.1	1107.0	0.0	1282.0	0.0	0.0	0.0	2433.1	0.0	2433.1	100.0%

a) Dead animals

Table 1-4 A

Projected Annual Quantities of Disposed, Diverted, and Generated Waste for Los Altos Hills (Tons/Year)  
Assuming Continuation of Current Programs

Year:	1991		1992		1,002		1993		1994		1,002		1995		1,002		1996			
	Material	Esc Factor a)	DISP	Div GEN	DISP	Div GEN	DISP	Div GEN	DISP	Div GEN	DISP	Div GEN	DISP	Div GEN	DISP	Div GEN	DISP	Div GEN		
1) TOTAL PAPER			1486	560 2046	27.4%	1489	561 2050	27.4%	1492	562 2054	27.4%	1495	563 2058	27.4%	1507	564 2071	27.2%	1518	565 2083	27.1%
OCC/Kraft			251	0 251	0.0%	252	0 252	0.0%	252	0 252	0.0%	253	0 253	0.0%	254	0 254	0.0%	256	0 256	0.0%
Mixed Paper			783	125 908	13.8%	785	125 910	13.7%	787	125 912	13.7%	788	125 913	13.7%	794	125 919	13.6%	799	125 924	13.5%
Newsprint			155	435 590	73.7%	155	436 591	73.8%	155	437 592	73.8%	156	438 594	73.8%	158	439 597	73.5%	161	440 601	73.2%
High Grade			16	0 16	0.0%	16	0 16	0.0%	16	0 16	0.0%	16	0 16	0.0%	16	0 16	0.0%	16	0 16	0.0%
Other Paper			281	0 281	0.0%	282	0 282	0.0%	282	0 282	0.0%	283	0 283	0.0%	284	0 284	0.0%	286	0 286	0.0%
2) TOTAL PLASTICS			375	33 408	8.0%	377	33 410	8.1%	377	33 410	8.0%	378	33 411	8.0%	381	33 414	8.0%	383	33 416	7.9%
HDPE			41	0 41	0.0%	41	0 41	0.0%	41	0 41	0.0%	41	0 41	0.0%	41	0 41	0.0%	42	0 42	0.0%
PET			9	33 42	78.5%	9	33 42	78.8%	9	33 42	78.6%	9	33 42	78.5%	9	33 42	78.0%	10	33 43	77.5%
Film			126	0 126	0.0%	126	0 126	0.0%	127	0 127	0.0%	127	0 127	0.0%	128	0 128	0.0%	128	0 128	0.0%
Other Plastics			200	0 200	0.0%	200	0 200	0.0%	201	0 201	0.0%	201	0 201	0.0%	202	0 202	0.0%	204	0 204	0.0%
3) TOTAL GLASS			129	388 517	75.1%	129	389 518	75.1%	130	389 519	74.9%	132	389 521	74.7%	135	389 524	74.3%	138	389 527	73.8%
Refillable Glass Bev.			4	0 4	0.0%	4	0 4	0.0%	4	0 4	0.0%	4	0 4	0.0%	4	0 4	0.0%	4	0 4	0.0%
Cairl Redemption Value			28	233 261	89.3%	29	233 262	89.1%	29	233 262	88.9%	30	233 263	88.7%	31	233 264	88.2%	33	233 266	87.7%
Other Recyclable			78	155 233	66.6%	78	156 234	66.7%	78	156 234	66.6%	79	156 235	66.4%	80	156 236	66.0%	82	156 238	65.6%
Other Non Recyclable			19	0 19	0.0%	19	0 19	0.0%	19	0 19	0.0%	19	0 19	0.0%	19	0 19	0.0%	19	0 19	0.0%
4) TOTAL METALS			445	134 579	23.1%	446	134 580	23.1%	447	134 581	23.1%	448	134 582	23.0%	452	134 586	22.9%	455	134 589	22.7%
Aluminum Cans			6	99 105	94.3%	6	99 105	94.5%	6	99 105	94.4%	6	99 105	94.2%	7	99 106	93.6%	7	99 106	93.1%
Bimetal Cans			0	27 27	100.0%	0	27 27	98.3%	1	27 28	98.1%	1	27 28	98.0%	1	27 28	97.4%	1	27 28	96.8%
Tin P/B Cans			44	0 44	0.0%	44	0 44	0.0%	44	0 44	0.0%	44	0 44	0.0%	45	0 45	0.0%	45	0 45	0.0%
Non Fe/Other Alurn			50	0 50	0.0%	50	0 50	0.0%	50	0 50	0.0%	50	0 50	0.0%	51	0 51	0.0%	51	0 51	0.0%
White Goods			78	8 86	9.3%	78	8 86	9.3%	78	8 86	9.3%	79	8 87	9.2%	79	8 87	9.2%	80	8 88	9.1%
Other Metal			267	0 267	0.0%	268	0 268	0.0%	268	0 268	0.0%	269	0 269	0.0%	270	0 270	0.0%	272	0 272	0.0%
5) YARD WASTES			796	1282 2078	61.7%	797	1285 2082	61.7%	798	1288 2086	61.7%	799	1291 2090	61.8%	809	1294 2103	61.5%	819	1297 2116	61.3%
6) OTHER ORGANICS			2843	34 2877	1.3%	2848	34 2882	1.3%	2854	34 2888	1.3%	2859	34 2893	1.3%	2875	34 2709	1.3%	2882	34 2726	1.2%
Food			428	0 428	0.0%	427	0 427	0.0%	428	0 428	0.0%	429	0 429	0.0%	431	0 431	0.0%	434	0 434	0.0%
Tires/Rubber			115	0 115	0.0%	115	0 115	0.0%	115	0 115	0.0%	116	0 116	0.0%	116	0 116	0.0%	117	0 117	0.0%
Wood			1191	0 1191	0.0%	1193	0 1193	0.0%	1196	0 1196	0.0%	1198	0 1198	0.0%	1205	0 1205	0.0%	1213	0 1213	0.0%
Ag Crop Residue			0	0 0	0.0%	0	0 0	0.0%	0	0 0	0.0%	0	0 0	0.0%	0	0 0	0.0%	0	0 0	0.0%
Manure			0	0 0	0.0%	0	0 0	0.0%	0	0 0	0.0%	0	0 0	0.0%	0	0 0	0.0%	0	0 0	0.0%
Textiles/Lather			114	0 114	0.0%	114	0 114	0.0%	114	0 114	0.0%	115	0 115	0.0%	115	0 115	0.0%	116	0 116	0.0%
Other Misc Organics			797	34 831	4.1%	799	34 833	4.1%	800	34 834	4.1%	802	34 836	4.1%	807	34 841	4.0%	812	34 846	4.0%
7) OTHER WASTES			366	2 368	0.5%	367	2 369	0.5%	367	2 369	0.5%	368	2 370	0.5%	370	2 372	0.5%	373	2 375	0.5%
Inert Solids			364	0 364	0.0%	365	0 365	0.0%	365	0 365	0.0%	366	0 366	0.0%	368	0 368	0.0%	371	0 371	0.0%
HHW			2	2 4	50.0%	2	2 4	49.9%	2	2 4	49.8%	2	2 4	49.7%	2	2 4	49.4%	2	2 4	49.1%
8) OTHER SPECIAL WASTES B			6	0 6	0.0%	6	0 6	0.0%	6	0 6	0.0%	6	0 6	0.0%	6	0 6	0.0%	6	0 6	0.0%
TOTAL			6246	2433 8679	28.0%	6259	2438 8697	28.0%	6273	2442 8715	28.0%	6286	2446 8732	28.0%	6335	2450 8785	27.9%	6383	2454 8837	27.8%

Total may not sum exactly due to rounding  
a) Escalation factor (Esc factor) is based on projected population data as reported by ABAG  
b) Small Household Appliances

Projected Annual Quantities of Disposed, Diverted, and Generated Waste for Los Altos Hills (Tons/Year)  
Assuming Continuation of Current Programs

Material	Year:		1,006 Percent		1998		1,006 Percent		1999		1,006 Percent		2000		1,006 Percent		2001		1,006 Percent	
	Escalator a)	Factor a)	DISP	DIV GEN	DISP	DIV GEN	DISP	DIV GEN	DISP	DIV GEN	DISP	DIV GEN	DISP	DIV GEN	DISP	DIV GEN	DISP	DIV GEN	DISP	DIV GEN
<b>1) TOTAL PAPER</b>			1530	566 2096	27.0%	1541	567 2108	26.9%	1553	568 2121	26.8%	1565	569 2134	26.7%	1565	569 2134	26.7%	1565	569 2134	26.7%
OCC/Kraft			257	0 257	0.0%	259	0 259	0.0%	260	0 260	0.0%	262	0 262	0.0%	262	0 262	0.0%	262	0 262	0.0%
Mixed Paper			805	125 930	13.4%	811	125 936	13.4%	816	125 941	13.3%	822	125 947	13.2%	822	125 947	13.2%	822	125 947	13.2%
Newsprint			163	441 604	73.0%	166	442 608	72.7%	169	443 612	72.4%	171	444 615	72.2%	171	444 615	72.2%	171	444 615	72.2%
High Grade			16	0 16	0.0%	16	0 16	0.0%	17	0 17	0.0%	17	0 17	0.0%	17	0 17	0.0%	17	0 17	0.0%
Other Paper			288	0 288	0.0%	290	0 290	0.0%	291	0 291	0.0%	293	0 293	0.0%	293	0 293	0.0%	293	0 293	0.0%
<b>2) TOTAL PLASTICS</b>			386	33 419	7.9%	388	33 421	7.8%	391	33 424	7.8%	393	33 426	7.7%	393	33 426	7.7%	393	33 426	7.7%
HDPE			42	0 42	0.0%	42	0 42	0.0%	42	0 42	0.0%	43	0 43	0.0%	43	0 43	0.0%	43	0 43	0.0%
PET			10	33 43	7.7%	10	33 43	7.6%	10	33 43	7.6%	11	33 44	7.5%	11	33 44	7.5%	11	33 44	7.5%
Film			129	0 129	0.0%	130	0 130	0.0%	131	0 131	0.0%	131	0 131	0.0%	131	0 131	0.0%	131	0 131	0.0%
Other Plastics			205	0 205	0.0%	206	0 206	0.0%	207	0 207	0.0%	209	0 209	0.0%	209	0 209	0.0%	209	0 209	0.0%
<b>3) TOTAL GLASS</b>			141	389 530	73.4%	144	389 533	73.0%	147	389 536	72.5%	151	389 540	72.1%	151	389 540	72.1%	151	389 540	72.1%
Refillable Glass Bev.			4	0 4	0.0%	4	0 4	0.0%	4	0 4	0.0%	4	0 4	0.0%	4	0 4	0.0%	4	0 4	0.0%
Call Redemption Value			34	233 267	87.2%	36	233 269	86.6%	38	233 271	86.1%	39	233 272	85.6%	39	233 272	85.6%	39	233 272	85.6%
Other Recyclable			83	156 239	65.3%	84	156 240	64.9%	86	156 242	64.5%	87	156 243	64.1%	87	156 243	64.1%	87	156 243	64.1%
Other Non Recyclable			19	0 19	0.0%	20	0 20	0.0%	20	0 20	0.0%	20	0 20	0.0%	20	0 20	0.0%	20	0 20	0.0%
<b>4) TOTAL METALS</b>			459	134 593	22.6%	462	134 596	22.5%	466	134 600	22.3%	470	134 604	22.2%	470	134 604	22.2%	470	134 604	22.2%
Aluminum Cans			8	99 107	92.5%	9	99 108	91.9%	9	99 108	91.4%	10	99 109	90.9%	10	99 109	90.9%	10	99 109	90.9%
Bimetal Cans			1	27 28	96.2%	1	27 28	95.6%	1	27 28	95.1%	2	27 29	94.5%	2	27 29	94.5%	2	27 29	94.5%
Tin P/B Cans			45	0 45	0.0%	45	0 45	0.0%	46	0 46	0.0%	46	0 46	0.0%	46	0 46	0.0%	46	0 46	0.0%
Non Fe/Other Alum			51	0 51	0.0%	52	0 52	0.0%	52	0 52	0.0%	52	0 52	0.0%	52	0 52	0.0%	52	0 52	0.0%
White Goods			80	8 88	9.1%	81	8 89	9.0%	81	8 89	9.0%	82	8 90	8.9%	82	8 90	8.9%	82	8 90	8.9%
Other Metal			273	0 273	0.0%	275	0 275	0.0%	277	0 277	0.0%	278	0 278	0.0%	278	0 278	0.0%	278	0 278	0.0%
<b>5) YARD WASTES</b>			828	1300 2128	61.1%	838	1303 2141	60.9%	848	1306 2154	60.6%	858	1309 2167	60.4%	858	1309 2167	60.4%	858	1309 2167	60.4%
<b>6) OTHER ORGANICS</b>			2708	34 2742	1.2%	2724	34 2758	1.2%	2741	34 2775	1.2%	2758	34 2792	1.2%	2758	34 2792	1.2%	2758	34 2792	1.2%
Food			436	0 436	0.0%	439	0 439	0.0%	442	0 442	0.0%	444	0 444	0.0%	444	0 444	0.0%	444	0 444	0.0%
Tires/Rubber			118	0 118	0.0%	118	0 118	0.0%	119	0 119	0.0%	120	0 120	0.0%	120	0 120	0.0%	120	0 120	0.0%
Wood			1220	0 1220	0.0%	1227	0 1227	0.0%	1235	0 1235	0.0%	1242	0 1242	0.0%	1242	0 1242	0.0%	1242	0 1242	0.0%
Ag Crop Residue			0	0 0	0.0%	0	0 0	0.0%	0	0 0	0.0%	0	0 0	0.0%	0	0 0	0.0%	0	0 0	0.0%
Manure			0	0 0	0.0%	0	0 0	0.0%	0	0 0	0.0%	0	0 0	0.0%	0	0 0	0.0%	0	0 0	0.0%
Textiles/Leather			117	0 117	0.0%	117	0 117	0.0%	118	0 118	0.0%	119	0 119	0.0%	119	0 119	0.0%	119	0 119	0.0%
Other Misc Organics			817	34 851	4.0%	822	34 856	4.0%	827	34 861	3.9%	833	34 867	3.9%	833	34 867	3.9%	833	34 867	3.9%
<b>7) OTHER WASTES</b>			375	2 377	0.5%	377	2 379	0.5%	379	2 381	0.5%	382	2 384	0.5%	382	2 384	0.5%	382	2 384	0.5%
Inert Solids			373	0 373	0.0%	375	0 375	0.0%	377	0 377	0.0%	380	0 380	0.0%	380	0 380	0.0%	380	0 380	0.0%
HHW			2	2 4	48.8%	2	2 4	48.5%	2	2 4	48.5%	2	2 4	47.9%	2	2 4	47.9%	2	2 4	47.9%
<b>8) OTHER SPECIAL WASTES</b>			6	0 6	0.0%	6	0 6	0.0%	6	0 6	0.0%	6	0 6	0.0%	6	0 6	0.0%	6	0 6	0.0%
<b>TOTAL</b>			6432	2458 8890	27.6%	6482	2462 8944	27.5%	6531	2466 8997	27.4%	6581	2470 9051	27.3%	6581	2470 9051	27.3%	6581	2470 9051	27.3%

Total may not sum exactly due to rounding  
a) Escalator factor (Esc factor) is based on projected population data as reported by ABAG  
b) Small Household Appliances

Projected Annual Quantities of Disposed, Diverted, and Generated Waste for Los Altos Hills (Tons/Year)  
Assuming Continuation of Current Programs

Material	Year:			Year:			Year:			Year:		
	2002	1,000	Percent	2003	1,000	Percent	2004	1,000	Percent	2005	1,000	Percent
Esc factor a):	DISP	DIV	GEN Diverted									
<b>1) TOTAL PAPER</b>	1565	569	2134	1565	569	2134	1565	569	2134	1565	569	2134
OCC/Past	262	0	262	262	0	262	262	0	262	262	0	262
Mixed Paper	822	125	947	822	125	947	822	125	947	822	125	947
Newsprint	171	444	615	171	444	615	171	444	615	171	444	615
High Grade	17	0	17	17	0	17	17	0	17	17	0	17
Other Paper	293	0	293	293	0	293	293	0	293	293	0	293
<b>2) TOTAL PLASTICS</b>	393	33	426	393	33	426	393	33	426	393	33	426
HDPE	43	0	43	43	0	43	43	0	43	43	0	43
PET	11	33	44	11	33	44	11	33	44	11	33	44
Film	131	0	131	131	0	131	131	0	131	131	0	131
Other Plastics	209	0	209	209	0	209	209	0	209	209	0	209
<b>3) TOTAL GLASS</b>	151	389	540	151	389	540	151	389	540	151	389	540
Refillable Glass Bev.	4	0	4	4	0	4	4	0	4	4	0	4
Calif Redemption Value	39	233	272	39	233	272	39	233	272	39	233	272
Other Recyclable	87	156	243	87	156	243	87	156	243	87	156	243
Other Non Recyclable	20	0	20	20	0	20	20	0	20	20	0	20
<b>4) TOTAL METALS</b>	470	134	604	470	134	604	470	134	604	470	134	604
Aluminum Cans	10	99	109	10	99	109	10	99	109	10	99	109
Bimetal Cans	2	27	29	2	27	29	2	27	29	2	27	29
Tin P/B Cans	46	0	46	46	0	46	46	0	46	46	0	46
Non FE/Other Alum	52	0	52	52	0	52	52	0	52	52	0	52
White Goods	82	8	90	82	8	90	82	8	90	82	8	90
Other Metal	278	0	278	278	0	278	278	0	278	278	0	278
<b>5) YARD WASTES</b>	858	1309	2167	858	1309	2167	858	1309	2167	858	1309	2167
<b>6) OTHER ORGANICS</b>	2758	34	2792	2758	34	2792	2758	34	2792	2758	34	2792
Food	444	0	444	444	0	444	444	0	444	444	0	444
Tires/Rubber	120	0	120	120	0	120	120	0	120	120	0	120
Wood	1242	0	1242	1242	0	1242	1242	0	1242	1242	0	1242
Ag Crop Residue	0	0	0	0	0	0	0	0	0	0	0	0
Manure	0	0	0	0	0	0	0	0	0	0	0	0
Textiles/leather	119	0	119	119	0	119	119	0	119	119	0	119
Other Misc Organics	833	34	867	833	34	867	833	34	867	833	34	867
<b>7) OTHER WASTES</b>	382	2	384	382	2	384	382	2	384	382	2	384
Inert Solids	380	0	380	380	0	380	380	0	380	380	0	380
HHW	2	2	4	2	2	4	2	2	4	2	2	4
<b>8) OTHER SPECIAL WASTES B</b>	6	0	6	6	0	6	6	0	6	6	0	6
<b>TOTAL</b>	6581	2470	9051	6581	2470	9051	6581	2470	9051	6581	2470	9051

Total may not sum exactly due to rounding  
a) Escalation factor (Esc factor) is based on projected population data as reported by ABAG  
b) Small Household Appliances

Table 1-4 B

Projected Annual Quantities of Disposed, Diverted, and Generated Waste for Los Altos Hills (Tons/Year)  
Assuming Continuation of Current Programs and Implementation of SRRF

Material	Year:		Percent Diverted	1991		Percent Diverted	1992		Percent Diverted	1993		Percent Diverted	1994		Percent Diverted	1995		Percent Diverted	1996		Percent Diverted						
	Esc factor a)	GEN		DISP	GEN		DISP	GEN		DISP	GEN		DISP	GEN		DISP	GEN		DISP	GEN		DISP	GEN				
1) TOTAL PAPER				1488	560	2046	27.4%	1489	561	2050	27.4%	1470	584	2054	28.4%	1428	630	2058	30.6%	1390	681	2071	32.9%	1093	990	2083	47.5%
OCC/Kraft				251	0	251	0.0%	252	0	252	0.0%	230	22	252	8.7%	186	67	253	26.5%	137	117	254	46.1%	106	150	256	58.7%
Mixed Paper				783	125	908	13.8%	785	125	910	13.7%	787	125	912	13.7%	788	125	913	13.7%	794	125	919	13.6%	524	400	924	43.3%
Newsprint				155	435	590	73.7%	155	438	591	73.8%	155	437	592	73.8%	156	438	594	73.8%	158	439	597	73.5%	161	440	601	73.2%
High Grade				16	0	16	0.0%	16	0	16	0.0%	16	0	16	0.0%	16	0	16	0.0%	16	0	16	0.0%	16	0	16	0.0%
Other Paper				281	0	281	0.0%	282	0	282	0.0%	282	0	282	0.0%	283	0	283	0.0%	284	0	284	0.0%	286	0	286	0.0%
2) TOTAL PLASTICS				375	33	408	8.0%	377	33	410	8.1%	377	33	410	8.0%	378	33	411	8.0%	381	33	414	8.0%	373	43	416	10.3%
HDPE				41	0	41	0.0%	41	0	41	0.0%	41	0	41	0.0%	41	0	41	0.0%	41	0	41	0.0%	32	10	42	24.0%
PET				9	33	42	78.5%	9	33	42	78.6%	9	33	42	78.6%	9	33	42	78.5%	9	33	42	78.0%	10	33	43	77.5%
Film				126	0	126	0.0%	126	0	126	0.0%	127	0	127	0.0%	127	0	127	0.0%	128	0	128	0.0%	128	0	128	0.0%
Other Plastics				200	0	200	0.0%	200	0	200	0.0%	201	0	201	0.0%	201	0	201	0.0%	202	0	202	0.0%	204	0	204	0.0%
3) TOTAL GLASS				129	388	517	75.1%	129	389	518	75.1%	130	389	519	74.9%	132	389	521	74.7%	135	389	524	74.3%	138	389	527	73.8%
Refillable Glass Bev.				4	0	4	0.0%	4	0	4	0.0%	4	0	4	0.0%	4	0	4	0.0%	4	0	4	0.0%	4	0	4	0.0%
Caff Redemption Value				28	233	261	89.3%	29	233	262	89.1%	29	233	262	88.9%	30	233	263	88.7%	31	233	264	88.2%	33	233	266	87.7%
Other Recyclable				78	155	233	66.6%	78	156	234	66.7%	78	156	234	66.6%	79	156	235	66.4%	80	156	236	66.0%	82	156	238	65.6%
Other Non Recyclable				19	0	19	0.0%	19	0	19	0.0%	19	0	19	0.0%	19	0	19	0.0%	19	0	19	0.0%	19	0	19	0.0%
4) TOTAL METALS				445	134	579	23.1%	446	134	580	23.1%	447	134	581	23.1%	448	134	582	23.0%	452	134	586	22.9%	455	134	589	22.7%
Aluminum Cans				6	99	105	94.3%	6	99	105	94.5%	6	99	105	94.4%	6	99	105	94.2%	7	99	106	93.6%	7	99	106	93.1%
Bimetal Cans				0	27	27	100.0%	0	27	27	98.3%	1	27	28	98.1%	1	27	28	98.0%	1	27	28	97.4%	1	27	28	96.8%
Tin P/B Cans				44	0	44	0.0%	44	0	44	0.0%	44	0	44	0.0%	44	0	44	0.0%	45	0	45	0.0%	45	0	45	0.0%
Non FE/Other Alum				50	0	50	0.0%	50	0	50	0.0%	50	0	50	0.0%	50	0	50	0.0%	51	0	51	0.0%	51	0	51	0.0%
White Goods				78	8	86	9.3%	78	8	86	9.3%	78	8	86	9.3%	79	8	87	9.2%	79	8	87	9.2%	80	8	88	9.1%
Other Metal				267	0	267	0.0%	268	0	268	0.0%	268	0	268	0.0%	269	0	269	0.0%	270	0	270	0.0%	272	0	272	0.0%
5) YARD WASTES				796	1282	2078	61.7%	734	1348	2082	64.7%	692	1394	2086	66.8%	650	1441	2090	68.9%	610	1493	2103	71.0%	569	1547	2116	73.1%
6) OTHER ORGANICS				2643	34	2677	1.3%	2648	34	2682	1.3%	2654	34	2688	1.3%	2659	34	2693	1.3%	2375	334	2709	12.3%	2292	434	2726	15.9%
Food				426	0	426	0.0%	427	0	427	0.0%	428	0	428	0.0%	429	0	429	0.0%	431	0	431	0.0%	434	0	434	0.0%
Tires/Rubber				115	0	115	0.0%	115	0	115	0.0%	115	0	115	0.0%	116	0	116	0.0%	118	0	118	0.0%	117	0	117	0.0%
Wood				1191	0	1191	0.0%	1193	0	1193	0.0%	1196	0	1196	0.0%	1198	0	1198	0.0%	905	300	1205	24.9%	813	400	1213	33.0%
Ag Cop Residue				0	0	0	0.0%	0	0	0	0.0%	0	0	0	0.0%	0	0	0	0.0%	0	0	0	0.0%	0	0	0	0.0%
Manure				0	0	0	0.0%	0	0	0	0.0%	0	0	0	0.0%	0	0	0	0.0%	0	0	0	0.0%	0	0	0	0.0%
Textiles/Leather				114	0	114	0.0%	114	0	114	0.0%	114	0	114	0.0%	115	0	115	0.0%	115	0	115	0.0%	116	0	116	0.0%
Other Misc Organics				797	34	831	4.1%	799	34	833	4.1%	800	34	834	4.1%	802	34	836	4.1%	807	34	841	4.0%	812	34	846	4.0%
7) OTHER WASTES				366	2	368	0.5%	367	2	369	0.5%	367	2	369	0.5%	368	2	370	0.5%	320	52	372	14.0%	273	102	375	27.2%
Inert Solids				364	0	364	0.0%	365	0	365	0.0%	365	0	365	0.0%	366	0	366	0.0%	318	50	368	13.6%	271	100	371	27.0%
HHW				2	2	4	50.0%	2	2	4	49.9%	2	2	4	49.8%	2	2	4	49.7%	2	2	4	49.7%	2	2	4	49.1%
8) OTHER SPECIAL WASTES b				6	0	6	0.0%	6	0	6	0.0%	6	0	6	0.0%	6	0	6	0.0%	6	0	6	0.0%	6	0	6	0.0%
TOTAL				6246	2433	8679	28.0%	6196	2501	8697	28.8%	6144	2570	8715	29.5%	6069	2663	8732	30.5%	5668	3116	8785	35.5%	5199	3639	8837	41.2%

Total may not sum exactly due to rounding

a) Escalation factor (Esc factor) is based on projected population data as reported by ABAG  
b) Small Household Appliances

Projected Annual Quantities of Disposed, Diverted, and Generated Waste for Los Altos Hills (Tons/Year)  
Assuming Continuation of Current Programs and Implementation of SRRE

Material Esc factor a):	Year:		1,006 Percent		1998		1,006 Percent		1999		1,006 Percent		2000		1,006 Percent		2001		1,006 Percent	
	DISP	DIV	DISP	DIV																
<b>1) TOTAL PAPER</b>	<b>980</b>	<b>1116</b>	<b>2096</b>	<b>53.3%</b>	<b>941</b>	<b>1167</b>	<b>2108</b>	<b>55.4%</b>	<b>928</b>	<b>1193</b>	<b>2121</b>	<b>56.3%</b>	<b>915</b>	<b>1219</b>	<b>2134</b>	<b>57.1%</b>	<b>915</b>	<b>1219</b>	<b>2134</b>	<b>57.1%</b>
OCC/Kraft	82	175	257	68.1%	84	175	259	67.7%	85	175	260	67.3%	87	175	262	66.9%	87	175	262	66.9%
Mixed Paper	430	500	930	53.8%	386	550	936	58.9%	366	575	941	61.1%	347	600	947	63.4%	347	600	947	63.4%
Newsprint	163	441	604	73.0%	166	442	608	72.7%	169	443	612	72.4%	171	444	615	72.2%	171	444	615	72.2%
High Grade	16	0	16	0.0%	16	0	16	0.0%	17	0	17	0.0%	17	0	17	0.0%	17	0	17	0.0%
Other Paper	288	0	288	0.0%	290	0	290	0.0%	291	0	291	0.0%	293	0	293	0.0%	293	0	293	0.0%
<b>2) TOTAL PLASTICS</b>	<b>376</b>	<b>43</b>	<b>419</b>	<b>10.3%</b>	<b>378</b>	<b>43</b>	<b>421</b>	<b>10.2%</b>	<b>381</b>	<b>43</b>	<b>424</b>	<b>10.1%</b>	<b>393</b>	<b>33</b>	<b>426</b>	<b>7.7%</b>	<b>393</b>	<b>33</b>	<b>426</b>	<b>7.7%</b>
HDPE	32	10	42	23.8%	32	10	42	23.7%	32	10	42	23.5%	43	0	43	0.0%	43	0	43	0.0%
PET	10	33	43	77.1%	10	33	43	76.6%	10	33	43	76.2%	11	33	44	75.7%	11	33	44	75.7%
Film	129	0	129	0.0%	130	0	130	0.0%	131	0	131	0.0%	131	0	131	0.0%	131	0	131	0.0%
Other Plastics	205	0	205	0.0%	206	0	206	0.0%	207	0	207	0.0%	209	0	209	0.0%	209	0	209	0.0%
<b>3) TOTAL GLASS</b>	<b>141</b>	<b>389</b>	<b>530</b>	<b>73.4%</b>	<b>144</b>	<b>389</b>	<b>533</b>	<b>73.0%</b>	<b>147</b>	<b>389</b>	<b>536</b>	<b>72.5%</b>	<b>151</b>	<b>389</b>	<b>540</b>	<b>72.1%</b>	<b>151</b>	<b>388</b>	<b>540</b>	<b>72.1%</b>
Refillable Glass Bev.	4	0	4	0.0%	4	0	4	0.0%	4	0	4	0.0%	4	0	4	0.0%	4	0	4	0.0%
Calli Redemption Value	34	233	267	87.2%	36	233	269	86.6%	38	233	271	86.1%	39	233	272	85.6%	39	233	272	85.6%
Other Recyclable	83	156	239	65.3%	84	156	240	64.9%	86	156	242	64.5%	87	156	243	64.1%	87	156	243	64.1%
Other Non Recyclable	19	0	19	0.0%	20	0	20	0.0%	20	0	20	0.0%	20	0	20	0.0%	20	0	20	0.0%
<b>4) TOTAL METALS</b>	<b>459</b>	<b>134</b>	<b>593</b>	<b>22.6%</b>	<b>437</b>	<b>159</b>	<b>596</b>	<b>26.7%</b>	<b>436</b>	<b>164</b>	<b>600</b>	<b>27.3%</b>	<b>430</b>	<b>174</b>	<b>604</b>	<b>28.8%</b>	<b>430</b>	<b>174</b>	<b>604</b>	<b>28.8%</b>
Aluminum Cans	8	99	107	92.5%	9	99	108	91.9%	9	99	108	91.4%	10	99	109	90.9%	10	99	109	90.9%
Bimetal Cans	1	27	28	98.2%	1	27	28	95.6%	1	27	28	95.1%	2	27	29	94.5%	2	27	29	94.5%
Tin/P/B Cans	45	0	45	0.0%	45	0	45	0.0%	46	0	46	0.0%	46	0	46	0.0%	46	0	46	0.0%
Non FE/Other Alum	51	0	51	0.0%	52	0	52	0.0%	52	0	52	0.0%	52	0	52	0.0%	52	0	52	0.0%
White Goods	80	8	88	9.1%	81	8	89	9.0%	82	8	90	8.9%	82	8	90	8.9%	82	8	90	8.9%
Other Metal	273	0	273	0.0%	250	25	275	9.1%	247	30	277	10.8%	238	40	278	14.4%	238	40	278	14.4%
<b>5) YARD WASTES</b>	<b>528</b>	<b>1600</b>	<b>2128</b>	<b>75.2%</b>	<b>487</b>	<b>1655</b>	<b>2141</b>	<b>77.3%</b>	<b>444</b>	<b>1710</b>	<b>2154</b>	<b>79.4%</b>	<b>402</b>	<b>1765</b>	<b>2167</b>	<b>81.5%</b>	<b>402</b>	<b>1765</b>	<b>2167</b>	<b>81.5%</b>
<b>6) OTHER ORGANICS</b>	<b>2208</b>	<b>534</b>	<b>2742</b>	<b>19.5%</b>	<b>2124</b>	<b>634</b>	<b>2758</b>	<b>23.0%</b>	<b>2041</b>	<b>734</b>	<b>2775</b>	<b>26.5%</b>	<b>1958</b>	<b>834</b>	<b>2792</b>	<b>29.9%</b>	<b>1958</b>	<b>834</b>	<b>2792</b>	<b>29.9%</b>
Food	436	0	436	0.0%	439	0	439	0.0%	442	0	442	0.0%	444	0	444	0.0%	444	0	444	0.0%
Trees/Rubber	118	0	118	0.0%	118	0	118	0.0%	119	0	119	0.0%	120	0	120	0.0%	120	0	120	0.0%
Wood	720	500	1220	41.0%	627	600	1227	48.9%	535	700	1235	56.7%	442	800	1242	64.4%	442	800	1242	64.4%
Ag Crop Residue	0	0	0	0.0%	0	0	0	0.0%	0	0	0	0.0%	0	0	0	0.0%	0	0	0	0.0%
Manure	0	0	0	0.0%	0	0	0	0.0%	0	0	0	0.0%	0	0	0	0.0%	0	0	0	0.0%
Textiles/Leather	117	0	117	0.0%	117	0	117	0.0%	118	0	118	0.0%	119	0	119	0.0%	119	0	119	0.0%
Other Misc Organics	817	34	851	4.0%	822	34	856	4.0%	827	34	861	3.9%	833	34	867	3.9%	833	34	867	3.9%
<b>7) OTHER WASTES</b>	<b>250</b>	<b>127</b>	<b>377</b>	<b>33.7%</b>	<b>227</b>	<b>152</b>	<b>379</b>	<b>40.1%</b>	<b>204</b>	<b>177</b>	<b>381</b>	<b>46.4%</b>	<b>207</b>	<b>177</b>	<b>384</b>	<b>46.1%</b>	<b>207</b>	<b>177</b>	<b>384</b>	<b>46.1%</b>
Inert Solids	248	125	373	33.5%	225	150	375	40.0%	202	175	377	46.4%	205	175	380	46.1%	205	175	380	46.1%
HHW	2	2	4	48.8%	2	2	4	48.5%	2	2	4	48.5%	2	2	4	47.9%	2	2	4	47.9%
<b>8) OTHER SPECIAL WASTES B</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0%</b>																
<b>TOTAL</b>	<b>4947</b>	<b>3943</b>	<b>8890</b>	<b>44.4%</b>	<b>4745</b>	<b>4199</b>	<b>8944</b>	<b>46.9%</b>	<b>4588</b>	<b>4410</b>	<b>8997</b>	<b>49.0%</b>	<b>4460</b>	<b>4591</b>	<b>9051</b>	<b>50.7%</b>	<b>4460</b>	<b>4591</b>	<b>9051</b>	<b>50.7%</b>

Total may not sum exactly due to rounding

a) Escalation factor (Esc factor) is based on projected population data as reported by ABAG  
b) Small Household Appliances

Projected Annual Quantities of Disposed, Diverted, and Generated Waste for Los Altos Hills (Tons/Year)  
Assuming Continuation of Current Programs and Implementation of SRRE

Material	Year:		Year:		Year:		Year:		Year:		Year:						
	Esc. factor a)	2002	1,000	Percent	2003	1,000	Percent	2004	1,000	Percent	2005	1,000	Percent	2006	1,000	Percent	
		DISP	DIV	GEN	DISP	DIV	GEN	DISP	DIV	GEN	DISP	DIV	GEN	DISP	DIV	GEN	
<b>1) TOTAL PAPER</b>		915	1219	2134	57.1%	915	1219	2134	57.1%	915	1219	2134	57.1%	915	1219	2134	57.1%
OCC/Kraft		87	175	262	66.9%	87	175	262	66.9%	87	175	262	66.9%	87	175	262	66.9%
Mixed Paper		347	600	947	63.4%	347	600	947	63.4%	347	600	947	63.4%	347	600	947	63.4%
Newsprint		171	444	615	72.2%	171	444	615	72.2%	171	444	615	72.2%	171	444	615	72.2%
High Grade		17	0	17	0.0%	17	0	17	0.0%	17	0	17	0.0%	17	0	17	0.0%
Other Paper		293	0	293	0.0%	293	0	293	0.0%	293	0	293	0.0%	293	0	293	0.0%
<b>2) TOTAL PLASTICS</b>		393	33	426	7.7%	393	33	426	7.7%	393	33	426	7.7%	393	33	426	7.7%
HDPE		43	0	43	0.0%	43	0	43	0.0%	43	0	43	0.0%	43	0	43	0.0%
PET		11	33	44	75.7%	11	33	44	75.7%	11	33	44	75.7%	11	33	44	75.7%
Film		131	0	131	0.0%	131	0	131	0.0%	131	0	131	0.0%	131	0	131	0.0%
Other Plastics		209	0	209	0.0%	209	0	209	0.0%	209	0	209	0.0%	209	0	209	0.0%
<b>3) TOTAL GLASS</b>		151	389	540	72.1%	151	389	540	72.1%	151	389	540	72.1%	151	389	540	72.1%
Refillable Glass Bev.		4	0	4	0.0%	4	0	4	0.0%	4	0	4	0.0%	4	0	4	0.0%
Call Redemption Value		39	233	272	85.6%	39	233	272	85.6%	39	233	272	85.6%	39	233	272	85.6%
Other Recyclable		87	156	243	64.1%	87	156	243	64.1%	87	156	243	64.1%	87	156	243	64.1%
Other Non Recyclable		20	0	20	0.0%	20	0	20	0.0%	20	0	20	0.0%	20	0	20	0.0%
<b>4) TOTAL METALS</b>		430	174	604	28.8%	430	174	604	28.8%	430	174	604	28.8%	430	174	604	28.8%
Aluminum Cans		10	99	109	90.9%	10	99	109	90.9%	10	99	109	90.9%	10	99	109	90.9%
Bi-metal Cans		2	27	29	94.5%	2	27	29	94.5%	2	27	29	94.5%	2	27	29	94.5%
Tin P/B Cans		46	0	46	0.0%	46	0	46	0.0%	46	0	46	0.0%	46	0	46	0.0%
Non Fe/Other Alum		52	0	52	0.0%	52	0	52	0.0%	52	0	52	0.0%	52	0	52	0.0%
White Goods		82	8	90	8.9%	82	8	90	8.9%	82	8	90	8.9%	82	8	90	8.9%
Other Metal		238	40	278	14.4%	238	40	278	14.4%	238	40	278	14.4%	238	40	278	14.4%
<b>5) YARD WASTES</b>		402	1765	2167	81.5%	402	1765	2167	81.5%	402	1765	2167	81.5%	402	1765	2167	81.5%
<b>6) OTHER ORGANICS</b>		1958	834	2792	29.9%	1958	834	2792	29.9%	1958	834	2792	29.9%	1958	834	2792	29.9%
Food		444	0	444	0.0%	444	0	444	0.0%	444	0	444	0.0%	444	0	444	0.0%
Tires/Rubber		120	0	120	0.0%	120	0	120	0.0%	120	0	120	0.0%	120	0	120	0.0%
Wood		442	800	1242	64.4%	442	800	1242	64.4%	442	800	1242	64.4%	442	800	1242	64.4%
Ag Crop Residue		0	0	0	0.0%	0	0	0	0.0%	0	0	0	0.0%	0	0	0	0.0%
Manure		0	0	0	0.0%	0	0	0	0.0%	0	0	0	0.0%	0	0	0	0.0%
Textiles/leather		119	0	119	0.0%	119	0	119	0.0%	119	0	119	0.0%	119	0	119	0.0%
Other Misc Organics		833	34	867	3.9%	833	34	867	3.9%	833	34	867	3.9%	833	34	867	3.9%
<b>7) OTHER WASTES</b>		207	177	384	46.1%	207	177	384	46.1%	207	177	384	46.1%	207	177	384	46.1%
Inert Solids		205	175	380	46.1%	205	175	380	46.1%	205	175	380	46.1%	205	175	380	46.1%
HHW		2	2	4	47.9%	2	2	4	47.9%	2	2	4	47.9%	2	2	4	47.9%
<b>8) OTHER SPECIAL WASTES B</b>		6	0	6	0.0%	6	0	6	0.0%	6	0	6	0.0%	6	0	6	0.0%
<b>TOTAL</b>		4460	4591	9051	50.7%	4460	4591	9051	50.7%	4460	4591	9051	50.7%	4460	4591	9051	50.7%

Total may not sum exactly due to rounding  
a) Escalation factor (Esc. factor) is based on projected population data as reported by ABAG  
b) Small Household Appliances

**Table 1-5 A**

**Projection of Disposed and Diverted Waste Quantities  
Assuming Continuation of Current Programs**

Year	Projected Growth Rate	Annual Waste Generated (Tons)	Annual Waste Diverted (Tons)	Waste Diverted (%)	Annual Waste Disposed (Tons)	* Annual Waste Disposed (Cubic Yards)
1991		8679	2433	28.03%	6246	24,984
1992	1.002	8699	2438	28.03%	6261	25,044
1993	1.002	8716	2442	28.02%	6275	25,100
1994	1.002	8734	2446	28.01%	6288	25,152
1995	1.006	8786	2450	27.88%	6337	25,348
1996	1.006	8839	2454	27.76%	6385	25,540
1997	1.006	8892	2458	27.64%	6434	25,736
1998	1.006	8945	2462	27.52%	6484	25,936
1999	1.006	8999	2466	27.40%	6533	26,132
2000	1.006	9053	2470	27.28%	6583	26,332
2001	1.000	9053	2470	27.28%	6583	26,332
2002	1.000	9053	2470	27.28%	6583	26,332
2003	1.000	9053	2470	27.28%	6583	26,332
2004	1.000	9053	2470	27.28%	6583	26,332
2005	1.000	9053	2470	27.28%	6583	26,332
2006	1.000	9053	2470	27.28%	6583	26,332

\* Compaction ratio 4:1

**Table 1-5 B**

**Projection of Disposed and Diverted Waste Quantities  
Assuming Continuation of Current Programs and  
Implementation of SRRE**

Year	Projected Growth Rate (%)	Annual Waste Generated (Tons)	Annual Waste Diverted (Tons)	Waste Diverted (%)	Annual Waste Disposed (Tons)	* Annual Waste Disposed (Cubic Yards)
1991		8679	2433	28.03%	6246	24,984
1992	1.002	8699	2502	28.76%	6197	24,788
1993	1.002	8716	2571	29.50%	6145	24,582
1994	1.002	8734	2663	30.49%	6071	24,283
1995	1.006	8786	3117	35.48%	5669	22,677
1996	1.006	8839	3639	41.17%	5200	20,800
1997	1.006	8892	3944	44.35%	4948	19,792
1998	1.006	8945	4199	46.94%	4746	18,985
1999	1.006	8999	4410	49.01%	4589	18,356
2000	1.006	9053	4591	50.71%	4462	17,848
2001	1.000	9053	4591	50.71%	4462	17,848
2002	1.000	9053	4591	50.71%	4462	17,848
2003	1.000	9053	4591	50.71%	4462	17,848
2004	1.000	9053	4591	50.71%	4462	17,848
2005	1.000	9053	4591	50.71%	4462	17,848
2006	1.000	9053	4591	50.71%	4462	17,848

\* Compaction ratio 4:1

Table 1-6

1991 Waste Disposal, Diversion, and Generation Rates (Existing Conditions )  
(All figures shown in tons)

Material Type	Residential (b)			Industrial			Self Haul			Total			PERCENT OF TOTAL GENERATED
	Disposed	Diverted	Generated	Disposed	Diverted	Generated	Disposed	Diverted	Generated	Disposed	Diverted	Generated	
Total Paper	1415	560	1975	68	0	68	3	0	3	1486	560	2046	27.37%
OCC/Kraft	207	0	207	43	0	43	1	0	1	251	0	251	0.00%
Mixed	767	125	892	15	0	15	1	0	1	783	125	908	13.77%
NewsPaper	153	435	588	1	0	1	0	0	0	155	435	590	73.73%
High-Grade	16	0	16	0	0	0	0	0	0	16	0	16	0.00%
Other	272	0	272	9	0	9	0	0	0	281	0	281	0.00%
Total Plastics	282	33	315	92	0	92	1	0	1	375	33	408	8.09%
HDPE	34	0	34	6	0	6	0	0	0	41	0	41	0.00%
PET	9	33	42	0	0	0	0	0	0	9	33	42	78.57%
Film	125	0	125	0	0	0	0	0	0	126	0	126	0.00%
Other	113	0	113	86	0	86	1	0	1	200	0	200	0.00%
Total Glass	97	388	485	31	0	31	0	0	0	129	388	517	75.05%
Refillable Beverage	3	0	3	1	0	1	0	0	0	4	0	4	0.00%
Cal Redemption	22	233	255	6	0	6	0	0	0	28	233	261	89.27%
Other Recyclable	63	155	218	15	0	15	0	0	0	78	155	233	66.52%
Other Non-Recyclable	9	0	9	9	0	9	0	0	0	19	0	19	0.00%
Total Metals	172	134	306	268	0	268	5	0	5	445	134	579	23.14%
Aluminum Cans	6	99	105	0	0	0	0	0	0	6	99	105	94.29%
Brerial	0	27	27	0	0	0	0	0	0	0	27	27	100.00%
Tin F/B	44	0	44	0	0	0	0	0	0	44	0	44	0.00%
Non-Ferrous	6	0	6	43	0	43	0	0	0	50	0	50	0.00%
White Goods	0	8	8	77	0	77	2	0	2	78	8	86	9.30%
Other	116	0	116	148	0	148	3	0	3	267	0	267	0.00%
Yard Waste	357	1282	1639	437	0	437	2	0	2	796	1282	2078	61.69%
Other Organics	733	34	767	1900	0	1900	10	0	10	2643	34	2677	1.27%
Food	426	0	426	0	0	0	0	0	0	426	0	426	0.00%
Tires/Rubber	28	0	28	86	0	86	0	0	0	115	0	115	0.00%
Wood	66	0	66	1118	0	1118	7	0	7	1191	0	1191	0.00%
AG Crop Residue	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Manure	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Textile/Leather	88	0	88	25	0	25	2	0	2	114	0	114	0.00%
Other Misc. Organic (c)	125	34	159	671	0	671	1	0	1	797	34	831	4.10%
Other Wastes	69	2	71	283	0	283	15	0	15	366	2	368	0.54%
Inerts	66	0	66	283	0	283	15	0	15	364	0	364	0.00%
HHW	2	2	4	0	0	0	0	0	0	2	2	4	50.00%
Special Wastes (a)	6	0	6	0	0	0	0	0	0	6	0	6	0.00%
TOTAL	3131	2433	5564	3079	0	3079	36	0	36	6246	2433	8679	28.03%

PERCENT OF TOTAL WASTE DIVERTED =

a) Small Household Appliances  
 b) Commercial Waste Included in Residential  
 c) 34.1 tons of diapers diverted shown under Other Misc. Organic

Note: Total may not sum exactly due to rounding.

# **SOURCE REDUCTION COMPONENT**

## **Introduction**

Source reduction is defined in Assembly Bill 939 (Public Resources Code, 40196) as "any action which causes a net reduction in generation of solid waste. Source reduction includes, but is not limited to, reducing the use of non-recyclable materials, replacing disposable materials and products with reusable materials and products, reducing packaging, reducing the amount of yard wastes generated, establishing garbage rate structures with incentives to reduce the amount of wastes that generators produce, and increasing the efficiency of the use of paper, cardboard, glass, metal, plastic, and other materials. Source reduction does not include steps taken after the material becomes solid waste or actions which would impact air or water resources in lieu of land, including, but not limited to, transformation."

Source reduction precedes waste management and addresses how products are designed, manufactured, purchased, and used so as to reduce the quantity and toxicity of waste produced when the products reach the end of their useful lives. Because of this, the most effective source reduction steps must be taken at the national level. Technical options for communities considering source reduction include product reuse, reduced material volume, reduced toxicity, increased product lifetime, and decreased consumption.

Source reduction as a component of waste reduction is not currently a widely applied concept. It is, therefore, difficult to estimate the actual impact that source reduction programs will have on the waste stream. However, source reduction may be practiced at the corporate or household level through selective buying patterns and reuse of products and materials. Source reduction programs and approaches can be implemented through education, financial incentives and disincentives, and regulations, as well as research and technological developments.

Source reduction is the first step in a hierarchy of approaches to integrated waste management. California State Assembly Bill 939 reflects this by placing source reduction at the top of the integrated waste management hierarchy. Unlike recycling, composting, transformation, and disposal (the other constituents of an integrated waste management system), source reduction is a preventative measure. Source reduction focuses on reducing or preventing the generation of solid wastes that must subsequently be managed by an integrated waste management system. In preventing waste generation, the impact of source reduction is reflected in the absence of wastes from the waste stream and is therefore very difficult to quantify. Source reduction is however, the single most effective method of reducing both the volume and the toxicity of the waste stream.

Source reduction not only reduces waste, but also conserves resources and energy, as well as reducing land, air, and water impacts.

Source reduction encompasses several broad categories, including:

- reduced waste generation through decreased consumption
- reduced material weight and volume
- material reuse
- increased product durability.

Figure 2-1 lists typical examples of decreased consumption and material reuse.

Over the long-term, effective source reduction will depend on changes in three distinct areas: (1) manufacturing and production processes; (2) retail marketing and packaging design; and (3) consumer behavior and consumption practices. The prospects for fostering change in production and packaging practices at the local level are fairly limited; such changes commonly require actions at a state or national level. In contrast, however, changes in consumer behavior and consumption patterns must begin at the local level and depend to a great extent on public education programs. To be effective, source reduction should become a factor influencing consumer decisions in favor of bulk purchases and product reusability, recyclability, and durability. Changes in consumption patterns will eventually affect manufacturing, production and packaging practices.

Available data on the municipal waste stream in the Town of Los Altos Hills indicated that the proportion of the residential waste stream that is most amenable to source reduction (paper, plastic, and yard waste) is significant and can be as high as 1 percent for paper, 2 percent for plastics, and 15 percent for yard waste, depending on the source of waste. The potential for effective source reduction in the Town of Los Altos Hills is therefore significant.

This component (1) describes existing conditions and presents source reduction objectives for the Town of Los Altos Hills, (2) evaluates a broad range of alternatives that may be used to achieve those objectives, (3) describes a process for selecting among the alternatives, and (4) identifies a plan of action to implement and monitor source reduction.

**Figure 2.1 Typical Examples of Source Reduction**

**Decreased Consumption**

**Reduce Material Volume**

- Use cloth towels
- Make two-sided copies
- Use routing slips
- Use electronic mail
- Buy in bulk
- Offer waste reduction incentives to employees

**Reduce Material Toxicity**

- Use product substitutes

**Increase Product Durability**

- Purchase durable goods
- Design durable products
- Provide/use maintenance contracts to extend the life of equipment

**Material Reuse**

- Retread tires, use refillable pens, reusable air filters and returnable bottles
- Provide/use returnable packaging containers
- Reuse packaging or packaging material
- Donate used equipment
- Use ceramic coffee mugs
- Reuse blank sides of paper for scratch
- Use silverware and dishes in the cafeteria
- Compost, mulch or chip on site
- Rent equipment rather than buying
- Use a waste exchange program
- Design for reuse or recyclability

## Objectives

The source reduction objectives presented in this section have been developed to meet the goal of reducing the amount of solid waste generated in the Town of Los Altos Hills. These objectives are to be implemented in the short-term planning period (1991-1995) and continued during the medium-term planning period (1996-2000). Through the following objectives, the Town of Los Altos Hills anticipates reductions in the total solid waste generated.

- reduce the use of non-recyclable materials
- replace disposable materials and products with reusable materials and products
- reduce packaging
- encourage product substitution toward less toxic materials
- purchase repaired or repairable products
- purchase durable products
- increase the efficiency of materials used in the commercial and industrial sectors
- reduce generation of yard waste and promote backyard or on-site composting.

Target waste types for source reduction have been identified, based on three factors: (1) the results of solid waste generation studies; (2) the effectiveness of meeting the source reduction objectives; and (3) criteria that include the volume and weight of the material, the hazard created by the material, the percent content of non-renewable resources, the durability of the material, and the recyclability of the material. These target waste types are outlined below.

- packaging materials, including plastics and paper products
- construction materials, including concrete, asphalt, lumber, metals and other inert solids
- paper, including office paper and mixed waste paper such as paper napkins, disposable bags, and non-recyclable junk mail
- yard waste
- single-use products, including disposable diapers, cups, utensils, office supplies, and personal care products
- repairable products, including appliances and electronics

Source reduction alternatives targeting the above waste types are presented and evaluated below in the section entitled "Discussion and Evaluation of Alternatives"

according to their effectiveness in meeting the source reduction objectives outlined above.

## **Existing Conditions**

This section describes existing source reduction activities and programs in the Town of Los Altos Hills. The jurisdiction has carefully reviewed and documented all potential and ongoing source reduction efforts. The existing source reduction diversion rate (that is measurable) is estimated to be less than one percent (34.1 tons) of the current total waste stream. This tonnage is derived from the use of re-usable cloth diapers as opposed to disposables. Local diaper services were surveyed who provided service in northern Santa Clara County. Surveyed companies provided the number of households per week that were serviced per jurisdiction. From this information source reduction estimates were derived. The calculated 34.1 tons is derived through the following information.

- Market share for cloth diapers in Los Altos Hills = 153,400
- Number of disposable diapers per ton = 4,500\*

$$153,400 / 4,500 = 34.1 \text{ tons}$$

\*4,500 diapers per ton of garbage reference sited in the Waste Characterization Study.

There is also a significant number of residents who compost at home, however the actual diversion amount is not quantifiable although believed to be substantial.

The quantities of wastes diverted by the Town's source reduction activities, by waste category and waste type are presented in Section 1 Waste Characterization Study. A description of the survey method used to identify and quantify the source reduction activities is presented in Appendix B.

## **Local Government Activities**

The Town of Los Altos Hills currently engages in the following source reduction activities:

- inverted rate structure with measured fees higher for greater use
- purchasing programs for products with recycled material content, reduced packaging and bulk purchases
- use of double-sided copiers in print shops

- use of non-disposable cups and utensils in Town Hall
- composting of leaf, wood and other organic wastes from public parks and grounds
- programs to provide education and information to employees and the general public on source reduction

## **Residential and Institutional Activities**

Residential and institutional source reduction activities in the Town of Los Altos Hills include:

- composting yard wastes, vegetables and food scraps
- reuse of materials
- use of cloth bags at grocery stores
- purchasing in bulk
- purchasing products with reduced or minimal packaging
- purchasing longer-lasting products
- participation in junk mail reduction programs
- purchasing products with limited or reduced amounts of environmental toxins

Of the source reduction activities and programs identified above, the Town of Los Altos Hills does not anticipate any program will be phased out or discontinued in the future.

The quantitative effectiveness of most current source reduction activities is difficult to assess, and the existing conditions for some source reduction activities is therefore qualitative. Additionally, many of the source reduction activities affecting the waste generated by the Town of Los Altos Hills are actually being conducted on a national scale. National efforts affecting the products purchased in stores and used by residences and businesses within the Town are described below.

## **National Source Reduction Efforts**

The following are some examples of major national source reduction efforts<sup>1</sup>:

- Some manufacturers offer concentrated versions of products which use less packaging, (e.g., frozen juices, concentrated pesticides, and concentrated soaps).

- One manufacturer is using reusable, collapsible or stackable boxes to replace expendable corrugated boxes for parts delivery from its suppliers.
- Over the past ten years aluminum beverage containers have been reduced in thickness and hence weight.
- Packaging changes initiated by one manufacturer include:
  - Disposable diapers and diaper packages changed so that net total amount of materials in product and package was 50 percent less than preceding designs.
  - Detergent with bleach eliminates need for purchase of bleach.
  - Half-gallon ice cream cartons have been reduced in weight by 30 percent over the last five years by changing the container's materials.
- One manufacturer changed the tub of a dishwasher from enameled steel to engineered plastic, which enables the warranty on the dishwasher to be increased because the tub is more durable.
- A new blow-molding tool for plastic (HDPE) milk bottles reduces their weight 10 percent while increasing strength.
- A heat-set technology makes it possible to use PET containers for liquids that must be hot-filled. The new technology allowed a juice company to switch from glass to plastic bottles, resulting in a 25 percent reduction in weight and long-term cost savings in bottling and shipping.
- One soap manufacturer has made a single-bar soap since about 1960; while this product requires some packaging, it avoids the use of larger containers.
- Plastic bags bought by a major "fast food" chain to ship products to its stores are designed to be reused as garbage bags.
- A large video rental and sales chain, trains its sales people to reuse the distinctive plastic bags that tapes are carried in and to ask customers to return tapes in the bags. This results in a savings of about \$1 million and over 25 million bags annually.

## **Evaluation of Alternatives**

This section presents alternatives for implementing successful source reduction programs that meet the objectives outlined above. Each alternative consists of several approaches to implementing the alternative; these approaches are called "programs" in this Source Reduction Component. Each of the alternatives is evaluated according to a set of criteria specified in the regulations implementing AB 939. Program costs are approximate and program details should be considered

preliminary. Costs and program details will be refined during development of specific programs.

Many of these alternatives are complementary to each other and depend significantly on the implementation of other alternatives, programs, or components presented elsewhere in the Source Reduction and Recycling Element (SRRE), such as recycling or composting components. Where possible, these relationships have been indicated in the criteria for evaluating the alternatives. An additional consideration in evaluating the alternatives is that their effectiveness and impact need to be considered on the basis of how several alternatives or programs will work together as a system, and not necessarily as alternatives independent of one another.

The source reduction alternatives have been grouped into four general categories:

- 1) Rate structure modifications, including local waste disposal fee modification and quantity-based local user fees
- 2) Economic incentives, including loans, grants, and loan guarantees, reduced business license fees, and deposits, refunds, and rebates
- 3) Technical assistance and public education, including technical assistance to consumer organizations, backyard composting workshops and awareness, educational efforts, public recognition activities, and municipal source reduction programs
- 4) Regulatory programs, including adoption of local ordinances to enhance source reduction, procurement programs, source reduction planning requirements by waste generators, product bans, and local land-use requirements.

Each of the four source reduction alternatives is described below and then evaluated according to a set of criteria specified by the regulations governing AB 939.

### **Alternative 1 - Rate Structure Modifications**

Source reduction activities can be encouraged through rate structure modifications, including disposal fees and quantity-based user fees for garbage collection services. The rate structure modifications described below address all source reduction objectives identified above in the section entitled "Objectives" and may be applied to both residential and non-residential generators.

**Disposal Fees:** Disposal fees at the landfill could be modified to promote source reduction by making the cost of disposal for non-recyclable and non-reusable wastes relatively high. Fees could also be imposed for goods and products that may be repaired, salvaged, or composted. This type of fee structure would serve to divert certain types of reusable materials from the waste stream. It would also create an incentive for purchasers of products to consider the costs of the products' eventual disposal in their purchasing decisions.

**Quantity-based User Fees:** These fees involve calculating collection and disposal fees based upon the amount of waste collected. This is similar in principle to other service-based utility charges such as water and electricity. Generators are charged fees according to the number of cans used, the number of bags collected, or the frequency of collection. Variable rate fees are directly proportional to actual disposal costs; consequently, residents have the opportunity to reduce costs by generating less waste.

There are a number of variants to the rate structure alternative, including:

- Use of a base subscription fee to cover fixed collection costs, plus a flat per-unit volume charge;
- Fees that rise according to increasing volume; and
- Charges based upon weight instead of volume.

These variants require some flexibility in the delivery of service to households and will lead to variation in whether containers are provided by the collector or provided by the generator; the types and sizes of containers used; and the use of stickers or special tags purchased to identify legitimate containers.

Most systems that currently charge a variable fee do so using volume as the basis. However, some communities support the concept that a weight-based system would be more equitable because not every container is necessarily full and the densities of some wastes are different from others. Some cities are experimenting with weight-based systems even though such systems require more collection time. Another requirement of these systems is that the collection vehicle have a scale and some type of record-keeping system to track the weight of the wastes by customer.

Jurisdictions implementing quantity based user fees or variable rate structures have frequently found that they do result in reduced quantities of disposed waste. Because of the reduction in waste quantities, however, the projected revenues generated by the system are often overestimated and insufficient to cover fixed costs. This problem may be solved through the use of a subscription fee to cover fixed costs, plus a variable fee for the actual quantities of waste collected.

Quantity-based user fees are most successful when free or low-cost collection of recyclables is provided in addition to collection of non-recyclables for disposal. Implementing recycling and yard waste programs in conjunction with the variable rate structure provides generators with alternatives to divert wastes from collection. Variable rate structures, however, do require both anti-dumping ordinances and anti-scavenging ordinances to deter these activities, since the variable rates and the recycling programs will tend to provide incentives for both dumping and scavenging.

Rate structure modifications are evaluated below to determine whether this alternative is appropriate for the Town of Los Altos Hills as well as to compare it to other alternatives.

**Effectiveness:** Rate structure modifications can be very effective in encouraging source reduction, since the cost of disposal or collection of disposables can be high. The economic incentive to reduce disposed waste will

cause generators to become more conscious of waste generation and may alter their habits to reduce the amount of material generated through purchasing decisions, backyard composting, product reuse, and other source reduction activities. Additionally, variable rate structures provide an incentive for increased participation in recycling and community composting programs. Studies have shown that, during the first year of operation, a volume-based rate system can reduce the volume of waste requiring disposal by 25 to 50 percent, although the weight of the waste tends to increase due to compaction. This assumes that no recycling programs are in effect. For communities where collection programs for recyclables are already in place, the impact of variable rate structures would be less significant.

The estimated impact on the waste stream of variable rate structures is difficult to quantify and depends on two factors: (1) the participation of waste generators in source reduction programs due to higher collection and disposal fees, and (2) the effectiveness of the source reduction activities undertaken by participating generators. These factors are sensitive to the rate at which collection and disposal fees rise; as fees increase, participation and effectiveness will increase. However, there is an upper limit to the variable rate structure beyond which illegal dumping will begin to occur.

**Hazard:** There is no direct environmental hazard associated with rate structure modifications. However, increased disposal and collection costs could result in an increase in illegal disposal, both on public property and in the disposal containers of commercial businesses. Variable rate structures may necessitate the installation of locking dumpster mechanisms for commercial containers. Illegal dumping could result in environmental and public health hazards.

**Ability to Accommodate Change:** Modifications to rate structures, in general, are easily adapted to changing conditions. Rate structures can also be further changed and modified as circumstances warrant. Over the medium- and long-term, this alternative is quite flexible. Most jurisdictions may find that their disposal and collection fees are not as flexible in the immediate time frame because of outstanding contracts with haulers and landfill operators. Additionally, once volume-based rates are established, subsequent rate changes require the approval of the jurisdiction's governing body.

**Consequences to the Waste Stream:** Rate structure modifications would be designed to reduce waste at the source and avoid substitution of a product or material that results in an equivalent or greater amount of waste being generated. Some shifting of wastes will occur in conversion to a volume-based system as more waste is compacted into each can, increasing the density of the waste stream. Rate structure modifications provide a strong incentive to divert items from the waste stream when other programs such as recycling and composting are available. The impact of this alternative, in concert with these other programs, is that the waste stream may be of lower volume, higher density, and contain much lower proportions of recyclables and yard wastes.

**Implementation Period:** Implementation of this alternative could occur within a period of months to a year and is well within the short-term planning period. However, potential opposition from the community and local government agencies could preclude implementation in the short-term planning period.

**Facility Requirements:** No additional facilities are needed to implement rate structure modifications.

**Consistency with Local Plans and Policies:** This alternative is generally consistent with the plans, policies, and ordinances of the Town of Los Altos Hills.

**Institutional Barriers:** The rate setting and approval process may require changes to current institutional relationships between local agencies responsible for administering the waste management program and those responsible for setting and approving local rates. These barriers become more complex when single or multiple private haulers and/or disposal facilities are included in the implementation and rate-setting process.

**Estimated Cost:** Implementing rate structure modifications would require at least six major steps:

- a rate study to determine appropriate rate structures for achieving the desired level of participation in source reduction programs
- a determination of how the proposed rate structure would impact the fixed and variable costs of collection and disposal
- review and approval by the Town of Los Altos Hills (including a public hearing)
- generation of informational and educational materials
- procurement of either containers or approved stickers for collection bags
- modification of existing billing operations

Costs for implementing the rate structure modifications in the Town of Los Altos Hills are estimated to range from minor to substantial and would be covered in new rates established.

**End Uses:** Not applicable.

## **Alternative 2 - Economic Incentives and Disincentives:**

Source reduction activities can be encouraged through economic incentives and disincentives. These include tax credits and exemptions, grants, loans, loan guarantees, penalties, and fines. At the state or national level, incentives and disincentives include deposits, refunds, rebates, and advanced disposal fees. Economic incentives and disincentives address all source reduction objectives identified above in the section entitled "Objectives."

Economic incentives and disincentives can foster source reduction in three ways: (1) direct economic benefits provided to businesses and consumers who participate in source reduction programs; (2) economic assistance to groups

and organizations whose mission includes fostering source reduction and supporting the community's waste management goals and objectives; and (3) placing a penalty upon the behavior, activity, or lack of action on the part of waste generators.

**Direct Economic Benefits:** Direct economic benefits are designed to encourage source reduction by providing an incentive to businesses and private organizations to implement source reduction programs and integrate source reduction activities into their operations. For example, tax credits and/or exemptions can be given to businesses that implement formal source reduction activities for manufacturing or procurement. Loans, grants, and loan guarantees can provide direct economic assistance to businesses for the purpose of implementing source reduction activities. Such economic assistance includes funds to purchase copy machines that produce double-sided copies and source reduction and recycling education materials for staff of these businesses. Reduced business license fees can also be granted to businesses that implement source reduction activities.

**Economic Incentives:** Economic assistance incentives are designed to enhance the effectiveness of other source reduction alternatives and programs. These economic incentives are primarily intended to support groups and programs that contribute to the education and technical assistance efforts of the community's source reduction campaign. For example, the Town of Los Altos Hills could provide loans, loan guarantees, or grants to encourage the economic development of businesses, non-profit groups, or associations that promote source reduction or otherwise foster waste reduction. Program(s) developed by the recipients of grants and loans could enhance local community source reduction programs such as public education, source reduction awareness campaigns, and any other aspect or component of the overall waste reduction effort.

For example, the Town of Los Altos Hills could provide a grant to the local chapter of an environmental group or public service organization to develop and implement composting workshops. These workshops could be timed to coincide with the beginning of other programs and alternatives, such as variable disposal rates and backyard composting programs. The Town of Los Altos Hills could provide funding and meeting rooms for workshops given by local chapters of conservation groups on source reduction techniques for the managers of commercial procurement programs. In addition, the Town of Los Altos Hills can also lend its support in exploring and developing other funding sources such as grants, industry financial support, in-kind support (donations of composting bins or use of facilities for workshop seminars), and private contributions to be used in developing and implementing source reduction programs.

This program emphasizes the provision of nominal amounts of support to facilitate the primarily volunteer efforts of local or regional groups and associations seeking to foster source reduction efforts at the community level. The Town of Los Altos Hills can provide both facilities and financial assistance to defray some of the costs of providing technical assistance and public education offered by these groups. This is one way that the Town of Los Altos Hills can forge a relationship and working partnership with volunteer and community interest groups and associations who seek to further community waste management goals and objectives. This alternative enables the Town of

Los Altos Hills to utilize the expertise and resources of volunteer interest groups in the community.

**Economic Disincentives:** Penalties and/or fines could be imposed by the Town of Los Altos Hills on institutions that do not develop and implement source reduction programs and practices. Alternatively, a municipality could impose a fine on institutions that fail to complete a short (one or two page) form providing data on their waste stream and outlining their source reduction practices. In addition, institutions could be required to demonstrate a program to purchase feedstock, inputs, materials, or inventories that have the minimum packaging possible (such as buying in bulk). Technical assistance could be provided to institutions for this program in the form of a pamphlet and informational flyer describing the kinds of data sought by the jurisdiction and its usefulness.

In Los Altos Hills, the requirements of this type of program would be restricted to institutional generators, thereby reducing enforcement costs. This program would provide a source of funding for other selected source reduction programs. For example, any fines collected could be allocated to fund programs conducted by local community groups to provide education and technical assistance for backyard composting programs. Data could be used to monitor changes in the waste stream over time and to evaluate the impact of source reduction programs on the waste stream. The form could be filed once a year with the local tax assessor or when obtaining and/or renewing a business license. Fees or penalties could be imposed on a yearly or quarterly basis.

**State and/or National Efforts:** Advanced disposal fees can be imposed at the state or national level on certain products that are either non-recyclable or non-reusable. Background research into this type of program has recently been completed for the CIWMB and is under consideration.<sup>2</sup> Products with excess packaging could also be made economically unattractive. A fee would be imposed on products that meet the following criteria: disposable, non-recyclable, or non-reusable; substitutes that were durable, reusable, or recyclable would need to be available. For example, a fee could be placed on disposable products such as pens, razors, cameras, beverage containers, utensils, personal care products, and disposable diapers. These fees could also be applied to products with a range of useful lifespans, with the fee applied to products with shorter life spans to induce the consumer to purchase the longer-lasting alternatives. Examples of these kinds of products are tires, batteries, and appliances.

This approach, now under consideration in California, could seek to establish a fee structure that creates a hierarchy of incentives to alter consumer behavior, as follows: (1) buy reusable, recyclable, and durable products; (2) repair older items such as white goods (replacement appliances may entail a fee); and finally, (3) purchase only what is necessary of products that are disposable and have no substitutes. Finally, deposits, refunds, and rebates can be provided for hard-to-recycle materials or materials that are non-durable, as well as for recycled or recyclable materials. This provides a positive incentive to grant purchase preferences to durable, reusable, recyclable products.

This alternative is evaluated below to determine whether it is appropriate for the Town of Los Altos Hills, as well as to compare it to other alternatives.

**Effectiveness:** Advanced disposal fees present an excellent mechanism for creating an incentive for consumers to source reduce by purchasing reusable, recyclable, and durable goods and by avoiding disposable, non-reusable, and non-recyclable products. Targeted sources for economic incentives include business and commercial sources (for direct economic incentives and disincentives) and both residential and nonresidential (for incentives applied through education and technical assistance programs). Advanced disposal fees would target residential and institutional generators, as well as retail vendors of products generally consumed and disposed of by residential generators.

**Hazard:** There are no environmental hazards created by the economic incentives and disincentives presented in this alternative.

**Ability to Accommodate Change:** Economic incentives can be modified to accommodate to changes in consumption patterns, availability of materials, and the economy. As the Town of Los Altos Hills, the waste management system, and the waste stream itself change over time, the ability of both businesses and private groups to apply economic incentives to source reduction efforts will change as well. Economic incentives are readily adaptable to new source reduction techniques and approaches as the latter become available, and as new methods and programs are developed.

**Consequences on the Waste Stream:** Economic incentives will reduce the amount of solid waste disposed. Changes in the waste stream composition will depend on the materials targeted by the incentive programs. The greatest potential for shifts in the waste stream composition would result from programs directed toward backyard composting and consumer purchasing awareness programs. Waste stream materials affected by these types of programs are yard wastes and wood cuttings, plastic and paper packaging, corrugated cardboard, and other packaging products.

**Implementation Period:** Economic incentives must be approved by the Town Council of Los Altos Hills. The amount of time required for the approval process and implementation of the program can range from 2 to 3 months to several years. Modifications to any economic incentive programs would undergo a similar approval process. Additionally, the implementation period for advanced disposal fees would depend on the types of fees and products involved.

**Facility Requirements:** No facilities are needed to implement economic incentives in the Town of Los Altos Hills.

**Consistency with Local Plans and Policies:** Providing economic assistance within the Town of Los Altos Hills or charging an advanced disposal fee may have no historical precedent. In this respect, this alternative may be viewed as inconsistent with local policies currently in place.

**Institutional Barriers:** The incentives proposed under this alternative would in many cases have to be funded by each municipality through general funds intended to serve the solid waste collection and disposal system. This could, in many cases, result in a need for rate increases to cover the expense of the incentive program. The disincentives presented under this alternative would not require funding and would actually generate revenue. The Town of

Los Altos Hills must administer a system for collecting and dispersing revenues gained through the fees, fines, and penalties.

**Estimated Cost:** The costs of this alternative would include the use of the Town of Los Altos Hills staff resources to develop and administer the incentive and disincentive programs. Staff resources would be necessary to develop, approve, implement, and administer each community project funded by the Town of Los Altos Hills. Additional costs include the direct dollar amounts of any grants or funding provided under the incentive programs. Although the disincentive programs would generate some level of revenue, whether they would cover their costs is unknown.

**End Uses:** Not applicable.

### **Alternative 3 - Technical Assistance, Education, and Promotion:**

The programs presented in this alternative address all source reduction objectives identified above in the section entitled "Objectives." These activities include technical assistance, educational efforts, backyard (on-site) composting, promotional programs (i.e., public recognition and awards), and municipal source reduction programs.

**Technical Assistance:** Technical assistance to institutions and consumers can be accomplished through workshops and seminars that address practical ways to reduce the quantity of wastes generated. Topics can include (1) decreased consumption; (2) reuse and recycling of materials; (3) procurement practices with preferences for reduced packaging, (4) increased durability, and increased recycled materials content; (5) increased manufacturing efficiency; and (6) composting of yard wastes at the site of generation.

Because yard waste is the largest component of the waste stream, source reduction or diversion programs targeted at these wastes can significantly impact the amount of waste disposed of by the community. Although technical assistance programs are often targeted at residential generators, these programs could also be applied to institutional generators of yard waste, including public agencies. Institutional generators, while fewer in number, often have commercial grounds management services to whom yard waste responsibilities can be delegated.

**Backyard (on-site) Composting:** The Solid Waste Generation Study shows that 1639 tons of yard waste was generated from the residential sector in the Town of Los Altos Hills in 1991. Generated yard waste includes; grass clippings, tree trimmings, weeds, leaves and brush. Much of this organic material could be composted on the same parcel of land where it originates, thereby decreasing collection costs and the costs associated with disposal or centralized composting. Backyard composting offers great promise for diverting wastes from collection systems. A significant number of Los Altos Hills residents already maintain their own compost piles. Increased participation in backyard composting would require dissemination of public education materials.

**Educational Efforts:** Educational efforts by the Town of Los Altos Hills would be an invaluable means of developing consumer awareness about the benefits of source reduction and changing consumption patterns. Implementing public education programs increases awareness of the solid waste problem, the economic and environmental benefits of source reduction programs, and the regulatory requirements of source reduction programs. These programs may also seek to change consumer purchasing patterns to reflect source reduction concerns. Educational efforts include developing and sponsoring consumer awareness programs, school curricula, seminars, and public forums.

In implementing public education programs, the Town of Los Altos Hills would act as a catalyst for source reduction efforts and serve as a clearinghouse for information on source reduction techniques. This would enable different sectors of the community to efficiently exchange source reduction information.

Public education programs are vital to the success of other programs (such as backyard composting) for community groups seeking to participate in source reduction efforts. Programs such as backyard composting can be encouraged on more than a strictly economic basis. The values of exercise, recreation, workmanship, science, education and community pride can be identified with home composting.

**Public Recognition and Awards:** Public recognition can be used by the Town of Los Altos Hills to publicly acknowledge individuals that have implemented source reduction activities. Awards could also be presented to community groups or individuals that are promoting source reduction in the community either through example or through education. These programs serve to complement other source reduction programs such as public education, technical assistance, and grant programs. Approaches developed for this alternative include local pride campaigns emphasizing waste reduction and environmental awareness; providing Town-sponsored door and window emblems for participating businesses; and reporting in the local newspaper examples of exemplary source reduction programs. These programs could enhance participation in other programs such as waste audits and commercial reporting requirements for source reduction programs.

**Municipal Source Reduction Programs:** These programs involve all methods to implement source reduction that are not associated with purchasing decisions. They require the Town of Los Altos Hills to undertake a number of activities aimed at altering the behavior of its own staff and operations to reduce the amount of waste generated on a day-to-day basis. These activities could include education programs familiarizing people with source reduction practices such as:

- double-sided copying
- increasing the use of scratch paper
- making fewer drafts of reports
- using electronic mail

This alternative provides an opportunity for the Town of Los Altos Hills itself to develop and implement a model source reduction program that can be used as an example for other private, public, and commercial entities in the area.

The following evaluation of technical assistance, education, and promotion activities for source reduction includes: technical assistance; composting programs; educational efforts; public recognition and awards; and municipal source reduction programs.

This alternative is evaluated below to determine whether it is appropriate for the Town of Los Altos Hills, as well as to compare it to other alternatives.

**Effectiveness:** An effective technical assistance program combined with education and promotion can result in significant reductions in quantities of solid waste disposed. Actual quantities of waste diverted are difficult to estimate and are dependent upon (1) the types of programs selected, (2) the scope of each program, and (3) the materials and generators targeted for program impact. The programs and approaches outlined by this alternative combine several factors that point to potentially high returns in terms of waste diverted through source reduction. First, this alternative targets the entire spectrum of waste generators. Second, the alternative targets the entire spectrum of wastes in the waste stream, from paper and plastic packaging to yard wastes and non-durable, disposable products.

Finally, this alternative consistently aims to use all existing resources within the community in terms of public service and environmental groups, associations, institutions, and private individuals. This alternative seeks to achieve gains in source reduction by utilizing non-public community resources pressed into service by well-organized and administered programs to increase awareness, achieve technology and information transfer, and publicly reward top performers. In this way, the programs outlined under this alternative support, enhance, and increase the effectiveness of other source reduction programs and alternatives.

**Hazard:** There are no hazards associated with the programs presented by this alternative. The Town of Los Altos Hills may seek to ensure that proper composting techniques are used so that no public health or fire hazards are created.

**Ability to Accommodate Change:** This alternative is easily adaptable to change as new methods and programs are developed. This alternative also readily accommodates to change in the waste stream, as well as to changes in consumer purchasing behavior and available products and alternatives. Indeed, once the public is sensitized to the Town of Los Altos Hills program of heightened environmental awareness, it may in fact be easier to introduce new concepts to further change public behavior. As the community, the waste management system, and the waste stream itself change over time, the expertise and abilities of community resources will change also. New techniques and approaches will become available to the Town of Los Altos Hills by virtue of the informal relationship between the public agencies, institutions, households, and community groups. Programs for public recognition, local pride, and environmental awareness can all be readily changed in their focus, scope, and intensity to accommodate changes in local waste management programs, changes in the waste stream, seasonal variations in waste characteristics, and other factors.

**Consequences to the Waste Stream:** Technical assistance, education, backyard composting and promotional activities would be designed to (1) reduce

waste at the source, and (2) avoid substitution of a product or material that results in an equivalent or greater amount of waste being generated. Direct community and institutional involvement with, and participation in, carefully implemented programs will reduce the amount of solid waste disposed. Changes in the waste stream composition will depend on the effectiveness of the technical assistance, public education, and promotion efforts and on the materials targeted for reduction by those responding to the message of these programs. The most likely areas for significant impact would be from programs aimed at backyard composting, institutional purchasing and procurement, and consumer-purchasing awareness programs. The waste stream materials affected by these types of programs are:

- yard wastes and wood cuttings
- corrugated cardboard
- other packaging products.

**Implementation Period:** This alternative can provide a range of options with respect to the scope and duration of the various programs outlined. Initial efforts in technical assistance, public education, backyard composting and promotional activities can be implemented in the short-term planning period. The need for additional staffing and the more involved aspects of the alternative, such as developing school curricula, are the main factors that could delay implementation to the medium-term.

**Facility Requirements:** No additional municipal facilities in the Town of Los Altos Hills would be required. Existing educational facilities could serve as locations for seminars and educational workshops.

**Consistency with Local Plans and Policies:** Technical assistance, education, backyard composting and promotional activities appear to be consistent with current policies in the Town of Los Altos Hills.

**Institutional Barriers:** There are no institutional barriers to implementing technical assistance, education, backyard composting and promotional activities for source reduction.

**Estimated Cost:** The costs for technical assistance, education, backyard composting and promotion will vary depending on a jurisdiction's commitment to funding a broad spectrum of programs. Generally, the cost of any of these programs will vary dramatically depending upon the scope of implementation. Each of the programs outlined in this alternative would require resources from the Town of Los Altos Hills for developing and administering the program. Although staffing would constitute the majority of the costs of implementing technical assistance, public education, composting and promotional activities, the programs outlined under this alternative involve some direct costs including: (1) costs associated with promotional brochures, pamphlets, flyers, door hangers, and (2) production costs for any use of the media or of outside consultants. Additional costs include those for publicity and public relations associated with awarding recognition and highlighting of specific activities within the community.

The costs associated with a municipal source reduction program are similar to those for developing and implementing any kind of awareness program within an institutional setting. The primary cost will be for staff time to develop and

implement a source reduction policy and program for the Town of Los Altos Hills. Additional costs include preparing and disseminating informational materials to staff, perhaps in the form of pamphlets or flyers posted at appropriate places in the work place.

**End Uses:** Not applicable.

#### **Alternative 4 - Regulatory Programs:**

Several regulatory program alternatives are available to the Town of Los Altos Hills that address the source reduction objectives outlined above in the section entitled "Objectives." These programs include:

- local procurement ordinances
- required waste reduction planning and reporting
- local product bans
- local land-use planning requirements

Regulatory programs require continuous enforcement efforts.

**Local Procurement Ordinances:** These ordinances involve adopting a procurement policy for the Town of Los Altos Hills specifying that several criteria be considered in the procurement selection of products and packaging, including: durability, recyclability, reusability, and recycled material content. Additionally, the Town of Los Altos Hills could specify that any organization holding a contract with the jurisdiction would have to have a source reduction plan or program and provide products or materials according to the above criteria. The Town of Los Altos Hills could adopt purchasing preferences and establish set-asides for recycled products or reusable products.

**Waste Reduction Plans:** These plans involve establishing waste reduction planning and reporting requirements for large, commercial or institutional waste generators. Waste reduction planning and reporting would require each business to establish a source reduction plan outlining what source reduction activities will be implemented. Businesses would also be required to report quantities of waste source reduced. One variant of this program would be to require the larger institutional generators in the community to implement the source reduction elements (and perhaps other elements, as well) similar to those of Assembly Bill 939. These entities would be held responsible for developing and implementing a plan that reduces the amount of waste disposed through source reduction (as well as recycling and composting) that satisfies the diversion requirements similar to those of AB 939. These institutions could report their progress on a regular basis, for example (1) when they apply for business license renewal, (2) when they pay their taxes, or (3) before the city or any private waste hauler renews a waste disposal agreement with them.

**Product Bans:** These are bans on targeted products and packaging techniques that result in a reduction of waste at the source. Bans might be considered on products and packaging that do not lend themselves to easy recyclability or source reduction. The criteria for product bans are similar to those used to determine the applicability of advanced disposal fees: the product must be disposable or difficult to reuse or recycle and must have environmentally

sound substitutes (e.g., razors, pens, non-reusable beverage containers). For example, some communities have banned polystyrene foam packaging from fast food restaurants. Other communities have banned items such as non-recyclable beverage containers. Communities that pursue this kind of alternative often adopt a time limit or phase-out period for the ban to take effect, providing time for businesses and others to adjust to the policy and identify substitutes.

**Land Use Requirements:** Land use and development requirements involve establishing incentives and disincentives to land use and development that promote source reduction. For example, the Town of Los Altos Hills could enact regulations requiring waste management planning as a condition for developing property for institutional or residential purposes. The required planning would consist of describing (1) how much and what type of waste to be added to the waste stream, and (2) what programs to be implemented to encourage source reduction on the developed area.

The alternative of providing regulatory programs to achieve source reduction objectives is evaluated below according to mandated criteria to determine whether it is appropriate for the Town of Los Altos Hills, as well as to compare it to other alternatives.

**Effectiveness:** The effectiveness of regulatory programs would depend on (1) the level of regulation imposed by the Town of Los Altos Hills, (2) the materials targeted, (3) adherence to the regulations by the community, and (4) the level of enforcement.

Targeted sources for regulatory programs include:

- the Town of Los Altos Hills administrative offices and other operations
- larger institutional generators
- residential and commercial consumers of banned products
- real estate developers

Materials diverted by regulatory approaches include (1) paper products and packaging; (2) plastic products and packaging; (3) all disposable items; (4) tires; (5) batteries; (6) non-reusable food service items; (7) food wastes; and (8) yard and wood wastes.

**Hazard:** There are no environmental hazards associated with the regulatory programs described above.

**Ability to Accommodate Change:** The regulatory measures outlined in this alternative vary in their flexibility to changing social and economic conditions. Procurement policies, waste reduction plans, and land development requirements are all fairly flexible and can readily accommodate to new circumstances in source reduction techniques and processes, as well as to changes in local source reduction programs and regulations. These programs can adapt to new types of packaging, new products and marketing formats, and to changes in the waste stream due to consumer behavior. Product bans, however, will not adapt quickly to change. Bans do not respond to changes in the marketplace or to new developments and techniques for using the product that might make it more acceptable for reuse or recycling. Common to each of the regulatory programs is the degree of inflexibility associated with the need

to submit any regulatory program to the formal approval process required by the Town of Los Altos Hills.

**Consequences to the Waste Stream:** Changes in the waste stream composition will depend on the effectiveness of each program. However, large changes in the waste stream could result from the availability of alternative products for procurement programs. Institutional generators have the potential for impacting specific waste categories (such as disposable diapers, food wastes, high-grade paper, or corrugated packaging and cardboard). A product ban will reduce the quantities of the banned product present in the waste stream. However, the ban could tend to increase the presence of product substitutes in the waste stream. The effect of product substitutes must be carefully considered when implementing a product ban to ensure that the substitutes do not themselves present problems involving increased disposed waste volume or toxicity.

**Implementation Period:** Procurement programs, waste reduction plans, and land-development plans can all be implemented in the short-term planning period. With product bans, however, communities usually allow a period of time for consumers, producers, and retailers to adjust to the effects of the ban. In addition, implementing a product ban over a longer time frame may allow for the opportunity to pursue this alternative in conjunction with neighboring jurisdictions. However, each of the regulatory programs outlined in this alternative would have to undergo a complex approval process, as well as anticipated resistance by businesses to any further regulation.

**Facility Needs:** There are no facility requirements for this alternative.

**Consistency with Local Plans and Policies:** Regulatory programs appear to be consistent with municipal policy for the Town of Los Altos Hills.

**Institutional Barriers:** Purchasing and procurement programs within the diverse public agencies will have to be coordinated in order to achieve a town-wide impact from a source reduction procurement program. While purchasing and procurement itself is often centralized within a town's operations, the individual agencies receiving or consuming the goods and services purchased must agree to any aspects of their purchase requests that would differ from their normal specifications. There are no institutional barriers presented by a product ban program, although there may be unknown legal ramifications associated with excluding a product from the market by implementing a local product ban.

**Estimated Cost:** Costs for regulatory programs largely depend on the level of regulatory programs that a jurisdiction chooses to pursue. Each of the programs outlined in this alternative would require resources from the Town of Los Altos Hills for developing, administering, implementing, and monitoring the program. Furthermore, each of the programs would involve costs associated with legal fees and staffing incurred during the approval process. Moreover, suitable products that meet source reduction requirements (and therefore identified as viable substitutes for products normally purchased), might be higher in cost to purchase. This would inflate the costs of procuring these items. Total costs for the Town of Los Altos Hills are estimated to range from minor to substantial.

**End Uses:** Not applicable

## **Selection of the Program**

In the previous section, four categories of alternatives were presented, each having several programs or approaches from which to select. Each category was evaluated qualitatively according to a range of criteria mandated by the regulations governing AB 939. In this section, the Town of Los Altos Hills presents the results of the qualitative evaluation of the alternatives and programs presented in the previous section. To accomplish this, the Town has applied an assessment of whether or not each alternative is appropriate to the Town's needs and assigned each alternative a ranking in order to select various alternatives and programs. In selecting among alternatives and programs, the Town considered the following critical factors (1) the degree to which each alternative and program is appropriate to the conditions of the jurisdiction (i.e., goals, objectives, policy environment, waste stream, solid waste management system and size of the Town), and (2) the degree to which the alternative and programs complement each other and form a coherent, comprehensive and cost effective package. Alternatives and programs were assigned ratings of high, medium, and low according to the assessment of their evaluation criteria. The results of these ratings are presented in Table 2-1 (see Appendix C).

Based on the results of the evaluation and assessment of the alternatives and programs, the programs and alternatives selected to meet the goals and objectives of this component in the short-term and medium-term planning periods are presented in Table 2-2 located at the end of this component.

### **Short-term Planning Period (Through the Year 1995)**

In order to meet the goals and objectives outlined in this component, the Town of Los Altos Hills will have to divert approximately 1 percent (87 tons) of the total waste stream in the short-term planning period. Source reduction programs should have a significant impact on the following waste categories; paper, plastic, and yard waste. The Town of Los Altos Hills has selected the following programs and alternatives:

- Continue a variable rate structure for refuse collection.
- Review small grants to community public service groups that support community programs by providing technical assistance or public education.
- If feasible, develop a program to provide technical assistance to institutions and consumers/homeowners through workshops and seminars on source reduction techniques and activities.
- Continue and expand a program to provide public education efforts through the media and Town programs to increase awareness of source reduction and waste management issues primarily through the Town *NEWSLETTER* and garbage bill inserts.

- If feasible, develop a program to provide public recognition and awards to individuals and institutions that implement source reduction activities.
- Continue non-procurement programs aimed at source reduction throughout Town offices and operations.
- Continue and support any multi-jurisdictional approaches to source reduction such as public education, disposal fees, and technical assistance.
- Continue to educate residents about the need for and means to backyard and community composting.

### **Medium-Term Planning Period (Through the Year 2000)**

In order to meet the goals and objectives outlined in this component, the Town of Los Altos Hills will have to divert approximately 1 percent (87 tons) of the total waste stream in the medium-term planning period. All programs and alternatives selected in the short-term planning period will be continued in the medium-term. In addition, the Town has selected the following programs.

- Review a program to establish land-use requirements that promote source reduction planning.
- Examine a program to institute product bans for certain materials and products sold within the Town.
- Monitor national source reduction efforts and trends in manufacturing and packaging to identify any potential areas for source reduction credit.
- Monitor efforts at the state level to encourage source reduction, including advance disposal fees, public education efforts, and other programs.

## Program Implementation

This section identifies and describes the specific tasks necessary to achieve full implementation of the selected alternatives and programs, identifies the government agencies and organizations responsible for implementing the selected source reduction programs and provides an implementation schedule. This information is presented in Table 2-2.

**Table 2-2**  
**Source Reduction Implementation Plan**

Town = Town of Los Altos Hills  
LAGCo = Los Altos Garbage Company  
County = Santa Clara County

<u>Task</u>	<u>Responsible Agency</u>	<u>Implementation Date</u>
<b><u>Short-Term</u></b>		
Continue backyard composting program	Town	already in affect
Continue public education program	Town/LAGCo	already in affect
Continue mullet-jurisdictional reduction approaches	Town/County	already in affect
Continue variable rate charging scheme	Town/LAGCo	already in affect
Review possibilities for technical assistance	Town	ongoing
Continue non-procurement program	Town	ongoing
Review award possibilities	Town/LAGCo	ongoing
Review grant options	Town/LAGCo	ongoing
<b><u>Medium-Term</u></b>		
Review program for land use regulations	Town	present-1999
Examine possible product bans	Town	1996-2000
Monitor and support state reduction efforts	Town/LAGCo	present-2000
Monitor and support national reduction efforts	Town/LAGCo	present-2000

## Monitoring and Evaluation

To ensure that the selected source reduction alternatives and programs are meeting the goals and objectives of this component, the Town will implement a monitoring and evaluation program. Because the objectives of this component extend throughout both the short-term and medium-term planning periods, the Town's monitoring and evaluation program will continue, as needed, during both planning periods.

Monitoring Methods: The methods for quantifying and monitoring the achievement of the component objectives are presented below in three groups: Objectives 1 and 2; Objectives 3, 4 and 5; and Objectives 6, 7 and 8.

**Objective 1:        Reduce the use of non-recyclable materials**

**Objective 2:        Replace disposable materials and products with reusable materials and products**

Monitoring Method: Further waste characterization studies will be planned at the end of the short-term planning period to measure changes in both waste types and waste quantities. These studies will be combined with more informal "spot check" assessments of waste composition to monitor reductions in non-recyclable and disposable materials.

**Objective 3:        Reduce Packaging**

**Objective 4:        Purchase repaired or repairable products**

**Objective 5:        Reduce generation of yard waste and promote backyard or on-site composting**

Monitoring Method: Residential surveys will be conducted and garbage company records analyzed to ascertain the degree to which households are reducing purchases with packaging, purchasing repaired or repairable products, and participating in backyard composting programs.

**Objective 6:        Purchase durable products**

**Objective 7:        Increase the efficiency of materials used in the institutional sectors**

**Objective 8:        Encourage product substitution toward less toxic materials**

Monitoring Method: Telephone surveys and analysis of garbage company records will be analyzed on an annual basis to make sure that local institutions are purchasing durable products and efficiently using materials.

**Written Criteria:** The Town will prepare reports describing the findings of the monitoring activities described above. The report will provide written criteria evaluating the effectiveness of the source reduction programs by reporting on whether (1) the source reduction objectives are being achieved;

(2) the selected programs and activities were implemented on schedule; (3) business procurement practices have changed; and (4) residents increasingly participate in and have a greater understanding of source reduction.

**Responsibility For Monitoring:** The monitoring and evaluation activities described in this section will be implemented by staff from the Town of Los Altos Hills.

**Funding Requirements:** Funding for the monitoring and evaluation program described in this section will be provided by the Town through disposal fees remitted by the garbage collection company. Funding for this program includes the costs of (1) administrative activities, (2) record-keeping, (3) program monitoring and surveying, and (4) annual report writing. Annual implementation costs to the Town for source reduction programs are estimated to range from \$0 - \$5,000 in the short-term planning period.

**Contingency Measures:** If the programs described above fail to meet the goals and objectives of this component, the following tasks can be implemented:

- Analyze existing programs and alternatives for obstacles to successful implementation.
- Modify selected alternatives, including degree, scope, or extent of source reduction activity and implementation schedule.
- Seek additional funding and staff.
- Select additional alternatives.
- Consider regulatory programs or mandatory programs.

FOOTNOTES\*\*\*\*\*

<sup>1</sup>This summary is based on information from U.S. Congress, Office of Technology Assessment, *Facing America's Trash - What Next for Municipal Solid Waste*, OTA-0-424, Washington, D.C.: U.S. Government Printing Office, October 1989.

<sup>2</sup>The CIWMB submitted the Disposal Cost Fee Study Final Report (Tellus Institute, Boston, Mass.) to the California Legislature and the Governor on March 1, 1991.

# **RECYCLING COMPONENT**

## **Introduction**

Recycling is defined in Assembly Bill 939 (Public Resources Code, 40180) as "the process of collecting, sorting, cleansing, treating, and reconstituting materials that would otherwise become solid waste, and returning them to the economic mainstream in the form of raw materials for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace." Recycling is an old practice that is taking on an increasingly important role in the waste management programs of many communities, as disposal capacity constraints have placed a premium on the diversion of materials from the waste stream. In addition to conserving land disposal capacity, this form of waste diversion helps preserve natural resources and reduce the environmental impacts associated with waste disposal.

As stated in AB 939, recycling goes far beyond merely collecting and separating post-consumer waste; recycling includes returning the recovered materials to the marketplace in the form of new products. Thus, markets for recovered materials are critical for the recycling process to be complete. Accordingly, recycling plans must include market development as well as program development.

The Town of Los Altos Hills recognizes the value of recycling and seeks to support appropriate programs and services dedicated to the recycling of a broad range of material. This component (1) describes existing conditions and presents recycling objectives for the Town of Los Altos Hills, (2) proposes a broad range of alternatives that may be used to achieve those objectives, (3) evaluates the proposed alternatives, and (4) identifies a plan of action, and means to implement and monitor the selected recycling programs. Los Altos Hills is primarily a residential community, with a few schools located within the Town limits. Therefore, all Town recycling efforts are directed towards the residential and institutional sectors. The discussion and evaluation of recycling practices also accounts for recyclable materials generated from residential and institutional construction practices.

## **Objectives**

The recycling objectives presented in this section have been developed to meet the goal of reducing the amount of solid waste generated in the Town of Los Altos Hills. These objectives are to be implemented in the short-term planning period (1991-1995) and continued during the medium-term planning period (1996-2000).

## **Short-Term Objectives**

The Town of Los Altos Hills can expect to divert 18% (1579 tons) of the total waste stream in the short term by implementing the following objectives:

- Maintain (and increase) level of participation in the residential recycling programs.
- Review and if feasible increase the number of material types collected from the residential and institutional sectors.
- Review and if feasible implement possible diversion programs for materials currently collected via industrial debris boxes such as construction/demolition debris.
- When feasible divert inert solids generated by Town agencies (e.g., department of public works, and capital improvement projects).
- Review refuse collection practices to optimize the economics of recycling operations.

The estimated diversion amount of 1579 tons is comprised of the following waste categories as estimates; paper (681 tons), plastic (33 tons), glass (389 tons), metals, excluding white goods (126 tons), other organics, excluding re-usable diapers (300 tons), and other wastes, excluding household hazardous waste (50 tons).

## **Medium-Term Objectives**

The Town of Los Altos Hills can expect to divert 31 - 32 percent (2782 tons) of the total waste stream in the medium term by implementing the following objectives:

- Divert additional waste types from the residential and commercial waste streams such as paper, plastics, glass and metal.
- Increase local demand for materials made from post-consumer wastes.
- Increase plastics recycling when economically feasible to include a wider variety of polymer types.
- If deemed feasible, implement a diversion program to divert inert solids and other waste such as concrete, asphalt, soil and wood from construction/demolition projects.
- Continue other programs implemented in the short-term planning period.

The estimated diversion amount of 2782 tons is comprised of the following waste categories as estimates; paper (1219 tons), plastic (33 tons), glass (389 tons), metals, excluding white goods (166 tons), other organics, excluding re-usable diapers (800 tons), and other wastes, excluding household hazardous waste (175 tons).

Target waste types for recycling have been identified from the results of solid waste generation studies and are based on five factors: (1) the effectiveness of meeting the recycling objectives described above; (2) the volume and weight of the materials; (3) the hazard created by the material; (4) the percent content of non-renewable resources; and (5) the recyclability of the material.

These target waste types are outlined below.

- newspaper
- corrugated cardboard
- mixed paper
- telephone books
- PET, HDPE, and other plastics
- film plastic
- glass
- aluminum cans
- tin cans
- small household appliances
- inert solids (asphalt, concrete, construction and demolition debris)
- wood waste

Recycling alternatives targeting the above waste types are presented and evaluated below in the sections entitled *Program Alternatives*, and *Evaluation of Alternatives*. Possible alternatives are evaluated based on their ability to effectively meet the recycling objectives outlined above.

## **Existing Conditions**

This section describes existing recycling activities and programs in the Town of Los Altos Hills. The jurisdiction has carefully reviewed and documented all potential and ongoing recycling efforts. The Town of Los Altos Hills has also surveyed recycling efforts, and local market development activities of local educational institutions.

The existing recycling diversion rate is estimated to be 13 percent (1107 tons) of the current total waste stream. The diversion estimate of 1107 tons is comprised of materials collected from the residential curbside recycling program including; paper, glass, plastics and metals (excluding white goods). The quantities of wastes diverted by the Town's recycling activities, by waste category and waste type, are presented in Table 3-1 at the end of this component. A description of the survey

method used to identify and quantify the recycling activities is presented in Appendix B.

### **Town Activities**

The Town of Los Altos Hills currently engages in the following recycling activities:

- Programs to provide education and information to residents and the general public on recycling;
- Canside (backyard) collection of recyclable newspaper, advertising inserts, white paper, stationery, brown paper bags, aluminum and tin cans, plastic (PET) bottles, and glass food and beverage containers.

### **Institutional Activities**

There are three private schools and one junior college in the Los Altos Hills town limits. The private schools are serviced by the same waste collector as local residences and have the same canside recycling service. Foothill College is serviced by Los Altos Garbage Company for waste removal services and coordinates and runs its own recycling service, which includes:

- Education of faculty and students regarding recycling efforts, alternatives, and ideas.
- Collection of aluminum, glass, computer paper and newspaper.

Town Hall is the only other non-residential entity within Town limits, and the facility also receives the same service as residences. All employees at Town Hall participate in recycling efforts. Construction debris from institutions are also reclaimed when possible.

### **Evaluation of Alternatives**

The Town of Los Altos Hills has evaluated the following recycling alternatives that could be implemented to meet its diversion goals. For ease of evaluation, these have been divided into alternatives that apply to collection and processing alternatives and those that apply to incentive alternatives. Collection and processing alternatives focus on possible means of collecting and processing recyclables, while incentive alternatives address ways of insuring community participation in any adopted program. Each of the alternatives is evaluated according to a set of criteria specified in the regulations implementing AB 939. Program costs are approximate and program details should be considered preliminary. Cost and program details will be refined during development of the specific programs.

Many of these alternatives are complementary to each other and depend significantly on the implementation of other alternatives, programs, or SRRE

Components, such as Source Reduction, Composting, and Education and Public Information. Where possible, these relationships have been indicated in the criteria for evaluating the alternatives. An additional consideration in evaluating the alternatives is that their effectiveness and impact need to be considered on the basis of how several alternatives or programs will work together as a system, and not necessarily as alternatives that are independent of one another.

Separation of recyclable materials from the waste stream is clearly the key to diverting materials from transformation or land disposal. The effectiveness of any recycling diversion program in meeting the goals of AB 939 is therefore extremely dependent upon the different methods that the jurisdiction uses to extract recyclables from the waste stream. The effectiveness of the various separation methods involves two primary factors: (1) the degree to which materials can be separated at the source of generation, which affects the cost, recovery rate, and quality of materials; and (2) the level of convenience to generators, which affects participation in the separation and collection programs. These factors tend to differentiate the following approaches.

Each of the recycling alternatives is described below and then evaluated according to a set of criteria specified by the regulations governing AB 939.

## **Collection and Processing Alternatives**

### **Alternative 1 - Canside/Curbside Collection:**

This alternative addresses the objective of collecting recyclables from single-family homes. Currently, properties in Los Altos Hills can have their recyclables collected from the curbside, or, at a higher rate, from backyard containers. Canside collection has proven to be an effective method of achieving high rates of residential participation in recycling programs. Canside programs can involve collection of either separated or mixed recyclables. Once the canside program is fully-established and evaluated, additional materials, such as corrugated cardboard, magazines, and mixed paper, can be added in order to increase recovery rates.

Another option the Town faces is to begin wet/dry collection (similar systems are used in Europe). Because few, if any, such programs currently exist for the residential sector in the U.S., the logistics and considerations for such a program are not known at this time. One type of wet/dry collection system that has been used in Europe involves three cans. One can contains all the recyclable materials that will go to a MRF for processing; this is essentially commingled collection. The second can contains all food scraps and other designated organic wastes. These materials would be composted. The third can contains all other materials that cannot be separated and would be taken to the landfill.

Generally, curbside collection programs are most successful when the level of service and convenience to the homeowner is the highest. Programs with collection schedules that minimize the amount of storage time of recyclables by households, that provide containers, and that are supported by aggressive public information campaigns tend to achieve higher participation and recovery rates. These programs will also generate materials with higher market quality due to lower levels of contaminants.

This alternative is evaluated below to determine whether it is appropriate for the Town of Los Altos Hills, as well as to compare it to other alternatives.

**Effectiveness:** This alternative would be effective in enhancing the participation and capture rates for residential generators and in reducing the amount of targeted recyclable material(s) disposed of in landfills.

**Hazard:** This alternative presents no major hazards.

**Ability to Accommodate Change:** This alternative is readily adaptable to changing conditions, especially to changes in material types, processing and handling techniques, and to changes in the waste management system and regulatory programs.

**Consequences to the Waste Stream:** This alternative has no known impact on waste-type generation.

**Implementation Period:** This alternative has already been implemented and would likely be completed during the medium term planning period with the expansion of additional material types collected.

**Facility Requirements:** A facility would be required for processing the collected recyclables and preparing them for shipment to markets.

**Consistency with Local Plans and Policies:** This alternative is consistent with local plans and policies.

**Institutional Barriers:** There are no known institutional barriers to this alternative.

**Estimated Cost:** Costs for the program presented in this alternative depend upon the scope of the projects undertaken and the existing programs and conditions in the jurisdiction. Costs for the Town of Los Altos Hills currently stand at \$5.60/month per residence.

**End Uses:** See section titled "Market Conditions."

**Public vs. Private Operation:** The programs outlined under this alternative could be operated by either a public or private entity.

## **Alternative 2 - Mobile Collection System**

A mobile collection system is one which moves, and can service more than one area. Under AB 939, the Town of Los Altos Hills is required to evaluate this alternative. Mobile systems are ideal for rural areas with low-density populations and can be effective in urban areas that do not currently have a curbside program. Jurisdictions with fairly high population densities and/or with many recycling collection programs in place may be better and more efficiently served by promoting and expanding curbside recycling programs.

This alternative is evaluated below to determine whether it is appropriate for the Town of Los Altos Hills, as well as to compare it to other alternatives.

**Effectiveness:** If run independent of curbside collection, this alternative would be effective in enhancing the participation and capture rates for residential generators and in reducing the amount of targeted recyclable material(s) disposed of in landfills. However, implementing this alternative could have a negligible impact if the curbside collection program were also in operation.

**Hazard:** This alternative presents no major hazards.

**Ability to Accommodate Change:** This alternative is readily adaptable to changing conditions, especially to changes in material types, processing and handling techniques, and to changes in the waste management system and regulatory programs.

**Consequences to the Waste Stream:** This alternative has no impact on waste-type generation.

**Implementation Period:** This alternative could likely be completed in the short-term planning period (1995).

**Facility Requirements:** Existing facilities must be expanded or altered. A mobile collection system would require a trailer for customer transactions and a storage area for material collected. The collection site should be secured at night to prevent scavenging. A facility for processing the recyclables would also be required.

**Consistency with Local Plans and Policies:** This alternative could be in conflict with the current curbside collection contract.

**Institutional Barriers:** If the collection site were located within the Town, logistical problems concerning noise, odors, and visual impacts may result. If mobile collection sites were taken to an existing resource recovery facility during night hours, the institutional impacts would be negligible.

**Estimated Cost:** Costs for the program presented in this alternative would depend upon the scope of the projects undertaken and the existing programs and conditions in the jurisdiction. Costs for the Town of Los Altos Hills are estimated at \$2.50/month per residence.

**End Uses:** See section titled "Market Conditions."

**Public vs. Private Operation:** A mobile collection program could be operated by either a public or private entity.

### **Alternative 3 - Buy-back Center**

Under AB 939, the Town of Los Altos Hills is required to evaluate a buy-back center alternative. A buy-back center is essentially a drop-off center at which participants are paid for the materials they bring in. These materials typically include aluminum cans, newspaper, glass, metal cans, plastic (PET and HDPE),

corrugated cardboard, and high-grade papers. Because of the nature of programs, buy-back centers must have regular business hours and be staffed full-time; they are often more labor intensive than drop-off centers and can require equipment not needed at drop-off centers.

This alternative is evaluated below to determine whether it is appropriate for the Town of Los Altos Hills, as well as to compare it to other alternatives.

**Effectiveness:** Buy-back centers in communities with established recycling programs can be less effective because wastes are simply transferred from other recycling programs where the generator is not paid for the materials recovered (such as curbside). Buy-back centers as a primary recycling method are more effective, but still far inferior to curbside or curbside programs in the amount of wastes diverted.

**Hazard:** This alternative presents no major hazards.

**Ability to Accommodate Change:** This alternative is readily adaptable to changing conditions, especially to changes in materials types, processing and handling techniques, and to changes in the waste management system and regulatory programs.

**Consequences to the Waste Stream:** This alternative has no known impact on waste-type generation.

**Implementation Period:** This alternative could likely be completed in the short-term planning period (1995).

**Facility Requirements:** New facilities would be required. A site, building, and processing equipment (e.g. scales, cash register, safe, calculators, hand carts) would be needed.

**Consistency with Local Plans and Policies:** This alternative is consistent with local plans and policies.

**Institutional Barriers:** Some institutional barriers exist for this alternative. A relatively convenient location would have to be selected and any necessary permits obtained. In addition, the center would have to be certified by the State Department of Conservation (DOC) as a buy-back center for California Redemption Value beverage containers under AB 2020. According to the DOC, this would require filing an application to become a certified recycling center.

**Estimated Cost:** Capital costs will vary depending on the site selected (e.g., whether new construction is required) and the type and size of the facility (e.g., if processing is done, more sophisticated equipment may be needed). Labor costs would vary depending on the size of the facility. Ideally, operating costs would be covered by revenues from the sale of recyclable materials.

**End Uses:** See section titled "Market Conditions."

**Public vs. Private Operation:** A buy-back center would likely be privately operated.

## **Alternative 4 - Divert Inert Solids Generated from Town Public Works and Private Construction/Demolition Projects to A Materials Processor**

This alternative addresses the objective of increasing recovery of recyclable construction and demolition materials such as wood and inert solids. Town public works crews are responsible for a small portion of the construction projects in the Town; the remainder are projects with private construction firms. The Town is aware that used asphalt or concrete is recyclable and may be used as road base and other construction material. Under this alternative, construction debris from both the Town Public Works Department and any contractors working in the Town would be processed at a resource recovery center when possible. As a long-term extension of this alternative, contractors and Town employees will be responsible for insuring that the maximum amount of used materials can be taken to an established processor. Small quantities (e.g. 1 ton or less) would be exempt from this requirement.

This alternative is evaluated below to determine whether it is appropriate for the Town of Los Altos Hills, as well as to compare it to other alternatives.

**Effectiveness:** This alternative is very effective in reducing the amount of targeted recyclable material(s) in the waste stream.

**Hazard:** Concrete and asphalt processing operations are extremely noisy (requiring ear protection) and produce a substantial amount of dust.

**Ability to Accommodate Change:** This alternative can readily adapt to changing conditions, due to the fact that the local market for asphalt, concrete and other demolition waste is relatively stable.

**Consequences to the Waste Stream:** This alternative will have no impact on waste-type generation.

**Implementation Period:** This alternative would likely be completed in the medium-term planning period (through 2000).

**Facility Requirements:** No new facilities are required as this alternative is intended to be integrated into existing processing facilities.

**Consistency with Local Plans and Policies:** This alternative is consistent with local plans and policies.

**Institutional Barriers:** This alternative will have no impact on institutional barriers; however, if more responsibility for insuring acceptable inert and demolition waste is shifted to the contractors, they may object.

**Estimated Cost:** Operating costs would include transportation and tipping fees. Tipping fees for asphalt and concrete vary depending on the load. Asphalt and concrete can vary between \$4.75 per cubic yard to \$6.50 per cubic yard, depending on whether the load contains wire mesh or rubber. On a per ton basis, disposal costs range from approximately \$2.00 per ton for asphalt to \$5.00 per ton for concrete.

**End Uses:** Reclaimed inert wastes would be used primarily as road base aggregate and bedding. Wood waste has a variety of uses such as ground cover, mulch and wood chips.

**Public vs. Private Operation:** Operation of the processing facility would be private.

## **Alternative 5 - Manual Material Recovery Operation/Mechanized Materials Recovery Operation**

Manual and mechanized material recovery operations are very similar to each other in function, with some differences in capital investment, facility size, equipment, and operating costs. Both types of facility involve sorting loads of waste in order to recover recyclable materials. The objective of these operations is to receive recyclable materials, remove the contaminants, and prepare the materials for transportation to markets. Both manual and mechanized recovery facilities allow materials to be recovered from mixed waste loads, which increases the types of materials recovered through established commercial/industrial programs. The processing capabilities of both of these types of recovery operations allow communities to establish comprehensive integrated recycling programs that are cost-effective.

Manual material recovery facilities are designed for the collection, processing, and marketing of recyclable material. A manual recovery facility will accept incoming loads to be tipped either onto a pad or into a hopper. The waste stream is then sorted and separated by hand, usually as it travels along a conveyor belt system. Mechanized material recovery facilities are very similar in design and operation to manual facilities except that the conveyor system is equipped with a series of mechanical processors that assist in the waste stream segregation. Although, separation and recovery is achieved through mechanical means, a portion of material is often still recovered manually by the facility operators.

This alternative is evaluated below to determine whether it is appropriate for the Town, as well as to compare it to other alternatives.

**Effectiveness:** This alternative is effective in reducing the amount of targeted recyclable material(s) in the solid waste stream.

**Hazard:** This alternative presents moderate hazards. These include the possibility of fire and explosion from any shredder operations and the possibility of explosion from compacting the residual load. Because some of the materials collected are combustible, there is a minor fire hazard associated with their storage. Health risks associated with manual sorting of refuse include exposure to potentially hazardous materials in the waste stream and working around equipment such as loaders, dozers, and compactors.

**Ability to Accommodate Change:** Both manual and mechanized facilities are readily adaptable to changing conditions.

**Consequences to the Waste Stream:** This alternative has no known impact on shifts in waste-type generation.

**Implementation Period:** Simple manual recovery operations (i.e., dump-and-pick) could be implemented in the short-term planning period. If begun shortly, facilities employing either manual or mechanical recovery could be implemented in the short-term planning period; however, sophisticated mechanized recovery operations would require design and development efforts more suited to the medium-term planning period.

**Facility Requirements:** This alternative requires significant resources for a facility large enough to handle the delivery, processing and short-term storage of both recyclable and non-recyclable components of the waste stream.

**Consistency with Local Plans and Policies:** The facilities in this alternative are consistent with local plans and policies.

**Institutional Barriers:** Both manual and mechanized recovery facilities will require state and local permits to operate.

**Estimated Cost:** The costs associated with this alternative depend on the type of facility and processing operation selected. Existing facilities and sites to be used for this alternative will also affect the cost.

**End Uses:** See section titled "Market Conditions."

## **Alternative 6 - Salvage at Solid Waste Facility**

Salvage at solid waste facilities involves the recovery of materials from loads that are left at a designated site, such as a landfill or transfer station. This type of activity is very similar to a manual material recovery operation, although generally under more open conditions. Salvaging also often differs from MRFs in the waste types separated. Salvaging may occur in a designated area prior to unloading as well as at the tipping face of the landfill or transfer station. These loads are often from uncompacted commercial debris boxes. This program, sometimes referred to as a "dump-and-pick" operation, would be instituted at one or more of the landfills serving the jurisdiction. A cement pad for sorting the materials is preferable, though not required, for this type of an operation. A cement pad would require a dedicating picking area. Salvage at solid waste facilities is usually restricted to clearly identifiable loads of specific items such as metals, white goods, wood waste, mattresses, as well as glass, plastics, and metal beverage containers. In addition, high-concentration loads of construction debris, soil, concrete, and asphalt are often diverted to a separate tipping area for recovery. Loads subject to salvage at solid waste facilities include residential, commercial, industrial, and self-haul loads.

This alternative is evaluated below to determine whether it is appropriate for the Town, as well as to compare it to other alternatives.

**Effectiveness:** This alternative is effective in reducing the amount of targeted recyclable materials(s) in the waste stream.

**Hazard:** Workers may be at risk due to refuse collection trucks coming in and out regularly and from working around large, moving equipment, such as loaders,

dozers, and compactors. Also, hazards could arise from workers exposure to potentially hazardous materials in the waste.

**Ability to Accommodate Change:** Salvaging at disposal or transfer facilities is moderately adaptable to change.

**Consequences to the Waste Stream:** This alternative has no known impact on shifts in waste-type generation.

**Implementation Period:** This alternative could be in operation in a matter of weeks. However, six months to one year could be required to begin salvaging at the landfill, depending on the permit revisions required.

**Facility Requirements:** This alternative can usually be integrated into existing facilities, although space constraints are a problem at certain facilities.

**Consistency with Local Plans and Policies:** This alternative is consistent with local plans and policies.

**Institutional Barriers:** Disposal or transfer facility permits may prohibit salvaging. These permits would have to be revised in order to incorporate salvaging.

**Estimated Cost:** The estimated costs are expected to be moderate.

**End Uses:** See section titled "Market Conditions."

## **Alternative 7 - Materials Handling Methods**

Source separation of recyclable materials generally enhances the integrity of recovered materials for end use. In addition, a variety of collection programs, from residential curbside programs to commercial programs, ensures a range of program options to serve differing types of generators and provide each with the optimal method of participating in recycling efforts. Level of service delivery and degree of convenience offered in separation and collection programs for recyclables can have a direct impact upon the quality of the materials eventually offered for sale to the recovered materials market.

This alternative is evaluated below to determine whether it is appropriate for the Town, as well as to compare it to other alternatives.

**Effectiveness:** The impact of a program to improve material handling methods would be to improve the quality of recovered materials offered to secondary markets. In addition, improved handling methods often implies collection and separation programs more closely tailored to the convenience of waste generators, thereby improving participation in the recycling program.

**Hazard:** This alternative presents no major hazards.

**Ability to Accommodate Change:** Programs to adopt alternative materials handling methods are fairly flexible and can readily accommodate new circumstances in recycling techniques and processes as well as to changes in

local recycling markets, programs, and regulations. Materials handling programs can easily adapt to new products and markets for recycled materials.

**Consequences to the Waste Stream:** This alternative is not expected to have any significant impact on shifts in waste-type generation. Recycled materials would be cleaner and of greater physical integrity.

**Implementation Period:** Alternative materials handling methods can be implemented in the short-term time period. However, the Town may wish to allow a period of time for a variety of generators to adjust to the effects of the program. In addition, implementing a material handling program over a longer time frame may allow for the opportunity to pursue this alternative in conjunction with neighboring jurisdictions. Pursuing this alternative in conjunction with other jurisdictions might facilitate agreements on potential materials recovery facilities.

**Facility Needs:** There are no facility requirements for this alternative, although the Town may wish to consider whether a transfer station or material recovery facility would enhance this program.

**Consistency with Local Plans and Policies:** This alternative does not pose any conflict with current plans, policies, and ordinances for the Town.

**Institutional Barriers:** This alternative presents no institutional barriers with the exception of potential conflicts with waste haulers in altering contracts to accommodate the new handling methods and implied changes in separation and collection methods.

**Estimated Cost:** Costs for this alternative are unknown, however, they would include costs for development, implementation, and monitoring of programs designed to apply the new materials handling methods. Furthermore, this program could involve costs associated with any approval process for new separation and collection methods. The costs to waste haulers must be determined by the Town.

**End Uses:** See section titled "Market Conditions."

## **Incentive Based Alternatives**

### **Alternative 1 - Changes to Zoning and Code Practices**

The Town of Los Altos Hills could explore a number of options to promote recycling activities through regulatory approaches such as zoning, land-use and building code requirements. Revisions to zoning and building code requirements could include a zoning ordinance that would require all new subdivision and institutional projects to plan and provide for recycling needs in building and site design. Land use and development requirements involve establishing incentives and disincentives to land use and developments that promote recycling. These include requirements that an entity could not open a new business, relocate an old one, or build or otherwise develop property for commercial, institutional, or residential purposes without presenting a plan describing the types and quantities of waste that would be added to the waste stream. The plan would

require descriptions of programs to be implemented to encourage materials separation and recycling at the developed area. In addition, the Town could identify recycling specifically in local codes as an allowable land use for a given zoning.

This alternative is evaluated below to determine whether it is appropriate for the Town of Los Altos Hills, as well as to compare it to other alternatives.

**Effectiveness:** The effectiveness of regulatory programs would depend on the level of change implied by the regulations imposed by the Town of Los Altos Hills, the materials targeted, adherence to the regulations by the community, and the level of enforcement.

**Hazard:** There are no environmental hazards associated with these regulatory programs, although hazards from incompatible land uses could result if some restrictions were not applied to the types of facilities allowed to be located in zoned areas.

**Ability to Accommodate Change:** The regulatory measures outlined in this alternative are all fairly flexible and can readily accommodate to new circumstances in recycling techniques and recovery processes as well as to changes in local recycling programs and regulations. These programs can adapt to new types of materials and products as well as to changes in the waste stream due to generator behavior. One aspect that is common to each of the regulatory programs is the degree of inflexibility associated with the need to submit any regulatory program to the formal approval process required by the Town.

**Consequences to the Waste Stream:** This alternative has no known impact on waste-type generation.

**Implementation Period:** Regulatory programs, such as zoning, building code and land-use requirements can all be implemented in the short-term time period. However, communities usually allow a period of time for residential and non-residential generators to adjust to the effects of new requirements. In addition, implementing programs such as these over a longer time frame may allow for the opportunity to pursue this alternative in conjunction with neighboring jurisdictions. Each of the regulatory programs outlined in this alternative would have to undergo an approval process as well as overcome anticipated resistance by generators to any further regulation by the Town. The complexity of, and opposition to, these programs may preclude their implementation in the short-, and perhaps medium-term, time frame.

**Facility Needs:** There are no facility requirements for this alternative.

**Consistency with Local Plans and Policies:** Regulatory programs may be viewed as inconsistent with Town policy if there are current plans for implementing voluntary source separation and recycling programs. However, in the absence of any stated commitment to voluntary approaches to recycling (and barring any conflicts with current plans, policies, and ordinances) regulatory approaches on recycling may not pose any conflict for the Town.

**Institutional Barriers:** Institutional barriers to this alternative involve potential conflicts within the jurisdiction between Town agencies responsible for implementing effective waste management programs designed to meet the

requirements of AB 939 and Town agencies responsible for regulating building construction and site development. New regulatory requirements for residential and commercial areas within the jurisdiction could be an impediment to attracting new growth and investment in the community, especially if similar restrictions are absent in neighboring jurisdictions.

**Estimated Cost:** Costs for regulatory programs depend primarily on the level of regulatory programs that the Town of Los Altos Hills chooses to pursue. Each of the programs outlined in this alternative would require resources from the Town for developing, administering, implementing, monitoring, and enforcing the program. Furthermore, each of the programs would involve costs associated with legal fees and staffing incurred during the approval process. Total costs to the Town are estimated to be moderate. It is difficult at this time to place a dollar value on any regulatory program. The costs of the regulatory programs outlined in this alternative would most likely be passed to the private sector.

**End Uses:** See section titled "Market Conditions."

**Public vs. Private Operation:** Not applicable.

## **Alternative 2 - Rate Structure Modifications**

Recycling activities can be encouraged through rate structure modifications including disposal fees and quantity-based user fees for garbage collection services. Rate structure modifications, described below, address all of the recycling objectives identified in the section titled "Objectives" and may be applied to both residential and non-residential generators.

**Disposal Fees:** Disposal fees at the landfill could be modified to promote recycling by making the cost of disposal for recyclable wastes relatively high. This type of fee structure would serve to divert recyclable materials from the waste-stream by creating an incentive for generators and haulers of wastes containing recyclables to either source separate the recyclable materials or take the wastes to a recovery facility.

**Quantity-Based User Fees:** Quantity based user fees involve calculating collection and disposal fees based upon the amount of waste collected. This is similar in principal to other service-based utility charges such as water and electricity. Generators are charged fees according to the number of cans used, the number of bags collected, or the frequency of collection. Variable rate fees are directly proportional to actual disposal costs; consequently, residents have the opportunity to reduce costs by separating recyclable materials from their waste stream, thereby generating less waste. Los Altos Hills currently employs variable collection rates based on the number of cans collected.

There are a number of variants to the rate structure alternative, including:

- Use of a base subscription fee to cover fixed collection costs plus a flat per-unit volume charge;
- Fees that rise according to increasing volume; and

- Charges based upon weight instead of by volume.

These variants require some flexibility in the delivery of service to households and will lead to variation in whether containers are provided by the collector or provided by the generator; the types and sizes of containers used; and the use of stickers or special tags purchased to identify legitimate containers.

Most systems that currently charge a variable fee do so using volume as the basis. However, some communities support the concept that a weight-based system would be more equitable because not every container is necessarily full and the densities of some wastes are different from others. Some cities are experimenting with weight-based systems even though such systems require more collection time and expense. Another requirement of these systems is that the collection vehicles have a scale and some type of a record-keeping system to track the weight of the wastes by customer.

This alternative is evaluated below to determine whether it is appropriate for the Town of Los Altos Hills, as well as to compare it to other alternatives.

**Effectiveness:** Rate structure modifications can be very effective in encouraging recycling, since the cost of collection and disposal of recyclables can be high. The economic incentive to reduce disposed waste will cause generators to become more conscious of waste generation and may alter their habits to reduce the amount of material generated through increased participation in source separation and recycling programs. In addition, generators may alter their purchasing decisions to substitute for more recyclable products due to their lower disposal cost through the recycling program. Additionally, variable rate structures provide an incentive for increased participation in source reduction and community composting programs.

The estimated impact on the waste stream of variable rate structures is difficult to quantify and depends on two factors: (1) the participation of waste generators in recycling programs due to higher collection and disposal fees, and (2) the effectiveness of the separation and recycling activities undertaken by participating generators as measured by their recyclables capture rate. These factors are sensitive to the rate at which collection and disposal fees rise; as fees increase, both participation and effectiveness will increase. However, there is an upper limit to the variable rate structure beyond which illegal dumping will begin to occur.

**Hazard:** There is no direct environmental hazard associated with rate structure modifications. However, increased disposal and collection costs could result in an increase in illegal disposal, both on public property and in the disposal containers of commercial businesses. Variable rate structures often necessitate the installation of locking dumpster mechanisms for commercial containers. Illegal dumping could result in environmental and public health hazards.

**Ability to Accommodate Change:** Modifications to rate structures, in general, are easily adapted to changing conditions. Rate structures can also be further changed and modified as circumstances warrant. Over the medium and long-term, this alternative is quite flexible. Most jurisdictions may find that their disposal and collection fees are not as flexible in the immediate time-frame because of outstanding contracts with haulers and landfill operators. Additionally, once

volume-based rates are established, subsequent rate changes require the approval of the jurisdictions governing body.

**Consequences to the Waste Stream:** Rate structure modifications would be designed to encourage source separation and recycling. Conversion to a volume based system will likely result in more waste being compacted into each can, thereby increasing the density of the waste stream. Rate structure modifications provide a strong incentive to divert items from the disposed waste stream such as yard waste and recyclable materials when programs for those elements of the waste stream are available. The impact of this alternative, in concert with these other programs, is that the disposal waste stream may be of lower volume, higher density, and contain much lower proportions of recyclables and yard wastes.

**Implementation Period:** Los Altos Hills has recently adjusted its disposal rates to cover the costs of the recycling program. Collection and disposal rates are usually adjusted on an annual basis, particularly when the waste service is provided by contract with private collection companies. However, potential opposition from the community and local government agencies could preclude implementation in the short-term planning period.

**Facility Requirements:** No additional facilities are needed to implement rate structure modifications.

**Consistency with Local Plans and Policies:** This alternative is generally consistent with the plans, policies, and ordinances of the Town of Los Altos Hills. Exceptions will occur when the plans and policies of the Town explicitly prohibit modifications to the rate system or the charging of a fee for disposal.

**Institutional Barriers:** The rate setting and approval process may require changes to current institutional relationships between Town agencies responsible for administering the waste management program and those responsible for setting and approving local rates.

**Estimated Cost:** Implementing rate structure modifications would require at least six major steps:

- a rate study to determine appropriate rate structures for achieving the desired level of participation in recycling programs
- a determination of how the proposed rate structure would impact the fixed and variable costs of collection and disposal
- review and approval by the Town of Los Altos Hills (including a public hearing)
- generation of informational and educational materials
- procurement of either containers or approved stickers for collection bags
- modification of existing billing operations

Los Altos Hills currently evaluates rates as the need arises. Changing rates to provide recycling incentives would be a relatively easy and standard process. Due

to the uncertain time commitments involved in a rate evaluation process, costs are difficult to estimate.

**End Uses:** See section titled "Market Conditions."

**Public vs. Private Operation:** This alternative is compatible with either public or private refuse collection.

### **Alternative 3 - Market Development**

Several options for market development for recycled materials are available to the Town of Los Altos Hills. Improving markets for recyclable goods makes recycling more cost effective, which in turn makes recycling more appealing to waste-handlers, and indirectly to waste producers. Options include participation in state-wide efforts sponsored by the California Integrated Waste Management Board such as CALMAX, a materials exchange program, use of public education and information programs to promote the use of products using recycled materials, the importance of "closing the loop", and local procurement ordinances. This alternative will focus on local procurement ordinances. Public education efforts by the Town will have to be aggressive and extensive to ensure successful source reduction, recycling, and composting efforts. Education and public information for materials recovery and recycling are discussed in the component on *"Education and Public Information."*

This alternative is evaluated below to determine whether it is appropriate for the Town of Los Altos Hills, as well as to compare it to other alternatives.

**Effectiveness:** The effectiveness of a procurement program would depend on the materials targeted and the impact of the jurisdiction's purchasing power on the regional markets for those materials. Due to Los Altos Hills' residential nature, the potential market for products using recycled materials is not as high as it is for cities of a more commercial nature.

**Hazard:** This alternative presents no major hazards.

**Ability to Accommodate Change:** Procurement policies are fairly flexible and can readily accommodate new circumstances in recycling techniques and processes as well as changes in local recycling markets, programs, and regulations. Procurement programs can easily adapt to new products and markets for recycled materials. One aspect of this alternative is the degree of inflexibility associated with the need to submit any regulatory program to the formal approval process required by the Town of Los Altos Hills.

**Consequences to the Waste Stream:** Changes in the waste stream composition will depend on the effectiveness of the procurement program. However, effective market development through procurement programs could lead to increased quantities of materials in the waste stream that have a high content of recycled material.

**Implementation Period:** Procurement programs can be implemented in the short-term time period. However, the Town of Los Altos Hills may wish to allow a period of time for governmental consumers, producers, and suppliers of products

to adjust to the effects of the procurement program. In addition, implementing a procurement program over a longer time frame may allow for the opportunity to pursue this alternative in conjunction with neighboring jurisdictions. However, this program would have to undergo a complex approval process. The complexity of these programs may preclude implementation in the short, and perhaps medium-term, time frame.

**Facility Needs:** There are no facility requirements for this alternative.

**Consistency with Local Plans and Policies:** This alternative would not conflict with current plans, policies, and ordinances for the Town.

**Institutional Barriers:** Purchasing and procurement programs across public agencies will have to be coordinated in order to achieve a Town-wide impact from a procurement program. While purchasing and procurement itself is often centralized within the Town's operations, the individual agencies receiving or consuming the goods and services purchased must agree to any aspects of their purchase requests that would differ from normal specifications.

**Estimated Cost:** Costs for a procurement program include resources from the Town for developing, implementing, administering, and monitoring the program. Furthermore, each of the programs would involve costs associated with legal fees and staffing incurred during the approval process. The costs to merchants associated with a procurement program are unknown. Additionally, there are potentially unknown costs connected with a procurement program in that suitable products meeting source reduction requirements (and therefore identified as viable substitutes for products normally purchased), might be higher in cost to purchase. This would inflate the costs of procuring these items.

**End Uses:** See section titled "Market Conditions."

**Public vs. Private Operation:** Not applicable.

## **Selection of Program**

In the previous section, a number of alternatives were presented. Each alternative was evaluated qualitatively according to a range of criteria mandated by the regulations governing AB 939. In this section, the Town of Los Altos Hills presents the results of the qualitative evaluation of the alternatives presented in the previous section. To accomplish this, the Town of Los Altos Hills has applied an assessment of whether or not each alternative is appropriate to the Town's needs and assigned each alternative a ranking in order to select various alternatives. In selecting among alternatives, the Town of Los Altos Hills considered the following critical factors: (1) the degree to which each alternative is appropriate to the conditions of the jurisdiction (i.e., goals, objectives, policy environment, waste stream, solid waste management system and the size of the Town), and (2) the degree to which the alternatives complement each other and form a coherent, comprehensive, and cost-effective package. Alternatives were assigned ratings of high, medium, and low according to the assessment of their evaluation criteria. The results of these ratings are presented in Table 3-2 (see Appendix C).

Based on the results of the above evaluation and assessment, the alternatives selected to meet the goals and objectives of this component in the short-term and medium-term planning periods are presented below.

## **Short-Term Planning Period**

In order to meet the goals and objectives outlined in this component, the Town of Los Altos Hills will have to divert approximately 18 percent (1579 tons) of the total waste stream through recycling efforts implemented in the short-term planning period. The Town of Los Altos Hills has selected the following programs and alternatives:

### **Collection Programs:**

- Continue the residential and institutional curbside/curbside collection program for recyclables and if feasible expand materials collected and/or encourage delivery to a drop-off center. This program will result in a 14 percent (1229 tons) diversion of the total waste stream for the following materials and waste types; newspaper (439 tons), cardboard (117 tons), mixed paper (125 tons) and commingled containers including glass, metal and plastics (548 tons). This selection is based on impact, effectiveness, and ease of short-term implementation.
- Review the possibility of implementing a program to divert inert solids and construction/demolition debris generated from public works and construction/demolition projects to a materials processor. This program will be reviewed to target the following waste types; asphalt, concrete, wood, and other building materials and estimates a 4% diversion through the recycling of the following waste categories; other organics, excluding diapers (300 tons) and inerts (50 tons).

### **Incentive Based Programs:**

- Review and, if appropriate, develop a program of regulatory approaches such as zoning, building code, and land-use requirements to promote recycling activities. This program will result in further diversion of the total waste stream.
- Examine options for market development within Los Altos Hills. Town Hall as well as local schools should be targeted. Market development will best be implemented through expanded and continued educational materials.
- Maintain and, if appropriate, adopt a new variable rate structure for residential collection. This program has resulted in increased diversion of the total generated waste stream for all residential recyclable materials.
- Continue Town-sponsored programs aimed at recycling throughout Town offices and operations.

- Continue, expand, develop and initiate any appropriate multi-jurisdictional approaches to recycling such as public education, disposal fees and market development.

## Medium-Term Planning Period

In order to meet the goals and objectives outlined in this component, the Town of Los Altos Hills will have to divert approximately 31 - 32 percent (approximately 2782 tons) of the total waste stream in the medium-term planning period. All programs and alternatives selected in the short-term planning period will be continued in the medium-term, and through education and feedback, short-term alternatives should see improved results. In addition, the Town of Los Altos Hills has selected the following program:

- Initiate where possible and practicable a program to divert inert solids generated from public works and construction/demolition projects to a materials processor. This program will result in 11 percent (975 tons) diversion of the total waste stream for the following material categories; wood waste (800 tons) and inerts (175 tons).
- Implement customer and hauler incentives where possible and practicable to insure that debris boxes used at construction sites containing inert and demolition wastes (e.g. wood) are "clean" enough for recovery at a recovery facility. User incentives can insure 90% diversion to a recovery center.
- Expand the number of materials collected in the residential curbside recycling program to increase diversion in the residential program from 18 percent to 20 percent (1807 tons). 1807 tons is comprised the following estimated diversion amounts per waste category; newspaper (444 tons), cardboard (175 tons), mixed paper (600 tons) and commingled containers including glass, plastic and metal (588 tons).

No new Town facilities would be necessary to implement either the short or the medium-term planning period recycling programs.

## Market Conditions

Recycling requires more than the separation and collection of materials; viable markets must exist for the recovered materials. This section addresses the existing market conditions relevant to the Town of Los Altos Hills, as well as on a broader scale (e.g., regional, statewide, national, and international). The focus is on those materials most often collected through recycling programs, such as various paper grades, plastics, metals, and glass. In addition, the Town of Los Altos Hills is aware of the Recycling Market Development Zones established under SB 1322 and will consider this option in conjunction with other local jurisdictions. Many resources exist which identify local markets for different materials; most of these are in the form of lists compiled by entities such as the California Department of Conservation (DOC) and the California Integrated Waste Management Board (CIWMB). For this reason, only highlights are addressed in this section. In addition, the DOC is in the process of preparing a statewide database called *Market*

*Watch* which will be fully operational in approximately 9-12 months, and will include information on markets in California.

The CIWMB has established a materials exchange program "CALMAX" which provides information on waste materials available and wanted throughout California. CALMAX is a free resource available to assist residents and businesses. LAGCo and the Town can inform interested parties about this free resource. In addition, the Town and LAGCo can promote the idea of "buying recycled" to residents and schools in Los Altos Hills as part of their educational efforts.

The Town of Los Altos Hills is in the fortunate position of being able to take advantage of the contracts that Los Altos Garbage Company has established with various processors nationwide, which amount to virtually guaranteed markets for many waste types; some of these are included in the following discussion.

**Old Newspaper (ONP):** Old Newspaper is the main grade of waste paper collected in the residential sector. A number of ONP markets are available in northern California, including the South Bay. Currently, the amount of ONP that is available nationwide for recycling far exceeds the demand. However, this situation is expected to change. It is estimated that the demand for ONP will almost double by 1995 due to increases in exports of ONP, increases in the paper board market, and other factors.

Because ONP is contaminated with printing inks, it is necessary to de-ink this raw material before it can be recycled for certain uses. The primary reason for excess ONP is the shortage of newsprint facilities that can de-ink the newspaper or reuse it. The de-inking capacity in the United States is expected to increase in the future to meet the anticipated demand and help balance the market.

End uses for ONP include newsprint, insulation, packing, building materials, and animal bedding. Newsprint manufacture is anticipated to be the largest market for ONP and is anticipated to increase significantly through the year 2000. Other end uses are anticipated to increase only marginally.

Current market prices paid for ONP in California range from \$25 to \$40 per ton. However, the market price for ONP is cyclical due to decreased collection in the winter months, paper mill shutdown for maintenance repair in the summer months, economic conditions, international exchange rates, and other factors. Some local haulers have contracts with Weyerhaeuser Paper Company (Weyerhaeuser) for newspaper.

**Old Magazines (OMG):** A new market is emerging for OMG; many newspaper recycling mills plan to use OMG in the production of newsprint. This will result in a lower demand--until more newspaper recycling opportunities emerge in the next couple of years--for ONP. OMG is now being used in newspaper recycling mills due to their conversion from a simple wash process to a flotation process of de-inking. The Smurfit Companies have converted to flotation de-inking and can utilize supplies of OMG. The current price paid is \$20 per ton; a higher price can be negotiated, based on volume. The main requirement for preparation of the magazines is that they be loose--not bagged or tied with string.

**High-Grade Waste Paper:** High-grade paper is a general description of various long-fiber grades of paper. High-grade paper includes white ledger, colored ledger, computer paper, and tab cards. These grades are more valuable for

recycling because of their strength, and thus command a higher price than other paper grades.

Market prices for high-grade paper are dependent on the price of pulp. Because high-grade wastepaper is often used as a substitute for pulp, high-grade paper prices tend to fall with the price of pulp. The market prices for different paper grades vary independently. However, the market price for higher grades are generally more stable than that paid for lower grades. The higher the degree of separation from the source, the higher the price paid for the paper. High-grade paper can be used in making writing paper, computer paper, napkins, facial tissues, and paper towels. Some local haulers have contracts with Weyerhaeuser for high-grade waste paper.

**Paperboard:** The Newark Group is a national producer of recycled paperboard made from a variety of paper and paperboard grades. The company produces uncoated boxboard, specialty paperboard, tube stock, coated boxboard, gypsum liner, corrugated medium, and other paperboard. The company has locations throughout the United States; the nearest one to the Town of Los Altos Hills is in Santa Clara called California Paperboard.

**Mixed Waste Paper:** As implied in its name, mixed paper refers to a paper stream containing more than one grade of paper. Mixed paper is a mixture, unsegregated by color or quality, of at least two of the following paper wastes: newspaper, corrugated cardboard, office paper, computer paper, white paper, coated paper stock, or other paper. The housing industry and the value of the U.S. dollar overseas greatly affect the demand for wastepaper. A strong dollar overseas means a decrease in the demand for waste paper. Secondary markets for recovered paper can be found in the U.S. and abroad. Mixed paper export has increased significantly and has allowed for growth in mixed paper recycling, particularly in the western United States. Local domestic markets, however, are fairly well saturated. Potential buyers for wastepaper in the Bay Area include: Weyerhaeuser in San Jose and DAI El Papers USA Corporation in Burlingame, but other markets need to be identified in order for recycling of mixed paper to be feasible in the Town of Los Altos Hills.

The primary use of waste paper is in the manufacture of combination boxboard which is used to make boxes for shoes, clothing, and dry foods. Other uses for mixed waste paper include the manufacture of roofing felt and construction paper building materials.

**Old Corrugated Containers (OCC):** The amount of OCC consumed in the U.S. is significant, approximately 15 million tons per year, due to its use in shipping packaging for most consumer products. The quantity of OCC in the waste stream is greater in the commercial sector than in the residential sector. OCC that has been separated properly can be used in the manufacture of new corrugated containers, cereal boxes, pad bases, and wallboard.

The market for OCC in California is very strong; more than one half of the collected OCC in California is used by mills within the state. Current market prices for OCC range from \$40 to \$65 per ton. Potential buyers for OCC collected in the Town of Los Altos Hills are Jefferson Smurfit and Weyerhaeuser in San Jose and DAI El Papers USA Corporation in Burlingame. Some local haulers have contracts with Weyerhaeuser for OCC.

**Aluminum Cans:** Approximately half of the aluminum disposed of in solid waste is in the form of cans. The waste recovery system for aluminum cans is highly successful. Compared to other recyclables, aluminum cans command the greatest price per pound.

Aluminum cans that have been separated can be used by the primary producers and are melted again and made directly into can stock. Aluminum scrap is used primarily by secondary aluminum producers. Current scrap value market prices for aluminum cans range from \$0.40 to \$0.55 per pound. The addition to the AB 2020 redemption value raises the total market price. Markets for aluminum cans exist in the U.S. and abroad.

**Steel Food and Beverage Containers:** Tin cans that are used as food containers are actually steel cans with a thin coating of tin. The percentage of tin in steel cans usually totals about 0.25 percent<sup>1</sup> and is worth approximately \$3 to \$4 per pound. Even this small amount of tin can cause contamination in steel-making. For this reason, de-tinning is used to both reclaim valuable tin and improve the quality of the steel scrap, although sometimes the post-consumer steel cans and scrap are used directly as a raw material.<sup>2</sup> Steel can recycling is expanding, due in part to increased participation by steel mills and de-tinning mills in collecting and purchasing used steel cans.<sup>3</sup> This is despite aggressive efforts by the aluminum can industry to enter the steel-dominated food can market.<sup>4</sup>

The major de-tinning companies have opened new facilities around the U.S. to accommodate the influx of steel cans and the demand from the steel industry. This has helped decrease transportation distances for recyclers.<sup>5</sup>

**Glass Cullet:** Waste glass usage in the U.S. is estimated at 25 to 30 percent of the glass produced. Cullet is primarily traded on the U.S. market, so its market price remains fairly constant. A primary concern for end use markets is the quality of the material. In the glass plant, contaminants can cause damage to equipment or result in a poor quality product. One of the problems with curbside collection of commingled glass is that it produces multi-colored shards of glass. Markets for mixed-color cullet are not as stable or lucrative as that for color-sorted containers.

The two primary end uses for recovered waste glass are cullet for new glass and as a raw material for making secondary products, such as glasphalt highway paving material, foamed insulation, and construction material.

Two potential markets for recovered glass are Golden State Glass Recycling in Newark and California CRINC in San Leandro. Neither charges a processing fee to take the materials. The glass market has become problematic for many recyclers recently, due to increased quality standards and demand for color-sorted materials. Current market prices for sorted California Redemption Value glass range from \$0.03 to \$0.05 per pound sometimes with a stipulation that the glass be color-sorted. The addition of the AB 2020 redemption values raises the total market price.

**Plastics:** Markets for plastics are fairly new, but the EPA predicts that as processing technologies are developed, plastics recycling will grow and new markets will develop.

Most soda containers are made out of polyethylene terephthalate (PET) which is the most recycled of all plastics. Over 160 million pounds of PET bottles were recycled in 1988. Post-consumer PET is prohibited for use in new food containers because of FDA restrictions (although certain developments are underway that may lift this restriction). The primary end use for PET is fiber, which is used in pillows, sleeping bags, and ski jacket insulation, among other things. The most desirable market for recycled PET is compounded, extruded, and molded plastic makers.

High-density polyethylene (HDPE) is used in the manufacture of jugs (e.g., milk, cider, distilled water) and bottles (e.g., laundry and dish detergent, motor oil, antifreeze). Although the market for recycled HDPE is growing, because of sanitary restrictions, these items are not recycled back into food packaging. Major potential markets for recycled HDPE are soft drink basecaps, plastics lumber, containers, drums, pails, and various types of pipes. One major West Coast processor of HDPE is Partek in Vancouver, Washington, which is adjacent to Portland, Oregon. Partek processes only HDPE Grade 2, and uses it to manufacture new containers. HDPE Grade 2 is used in its natural color for milk, water, and juice jugs and is colored for use in laundry detergent containers, shampoo and conditioner bottles, and antifreeze containers.

Low-density polyethylene (LDPE) is used primarily in the manufacture of various types of film, such as food wrapping. Greater than 1,310 million pounds of it is made into trash bags. It is also used to make piping and to coat wires and cables.<sup>6</sup> It is also used in the manufacture of rigid items, such as food storage containers and flexible lids.<sup>7</sup> LDPE is used in plastic grocery bags, which is one of the fastest growing segments of recycling. Four manufacturers provide most of the grocery sacks in North America and are committed to separating plastic grocery sacks from the waste stream to make them into new products.<sup>8</sup>

Some local markets for LDPE are Bay Polymers in Fremont, RPX Resins in Scotts Valley, and Tech Polymers in Berkeley. Also, Dow Chemical Company and Sealed Air Company have formed a joint venture to recycle LDPE; one of its local plants is in Hayward. At this time, the program is available to Dow and Sealed Air customers only, but expansion of the program is being considered.<sup>9</sup>

**Polystyrene:** There are various forms of polystyrene, the most familiar being the foamed or expanded polystyrene foam (EPS) commonly referred to as styrofoam. The uses for EPS foam include fast-food single serve cups and trays and packing materials in both rigid, molded form and in loose form or "peanuts," as it is sometimes called. The local market for polystyrene products includes Free-Flow Packaging Corporation in Redwood City and Bay Polymer Corporation in Fremont. Recovered polystyrene can be used in the manufacture of toys, office equipment, insulation, and cassette casings.

**Telephone Books:** Louisiana Pacific Company in Oroville expects to use a steady supply of telephone books for its particle board manufacture once it has its equipment for that part of the operation in place. The company uses phone books to make up approximately 10 percent of the content of its particle board. The company is presently in the early stages of acquiring the additional equipment necessary to expand its capacity. Currently the primary market for telephone books is overseas.

**Inert Solids:** Asphalt and concrete from construction demolition gets landfilled in many areas, although it is often recyclable. Local recyclers are Raisch Products in San Jose, Zanker Road Landfill in San Jose, and Stevens Creek Quarry, Inc. in Cupertino.

**Overseas Markets:** Strong markets exist abroad (e.g., Mexico, Saudi Arabia, Pacific Rim nations) for many materials, especially mixed waste paper and newspaper. Numerous brokers on the West Coast represent these markets and are listed in various references.

## Program Implementation

This section identifies and describes the specific government agencies responsible for implementing the selected alternatives; the specific tasks necessary to achieve full implementation of the selected alternatives; and an implementation schedule. This information is presented on the following page in Table 3-3. Additionally, the costs, revenues, and revenue sources necessary for implementation of the selected alternatives are presented on the following page in Table 3-4.

**Table 3-3  
Recycling Implementation Plan**

Town = Town of Los Altos Hills  
LAGCo = Los Altos Garbage Company

<u>Task</u>	<u>Responsible Agency</u>	<u>Implementation Date</u>
<b><u>Short-Term</u></b>		
Canside collection or recyclables	Town/LAGCo	Already implemented
Expand materials collected in residential program if feasible	Town/LAGCo	July 1993
Review Program to Divert Inerts	Town/LAGCo	December 1994
Review regulations	Town/LAGCo	Ongoing review
Review Market Development Options	Town/LAGCo	Ongoing
Review Rates	Town/LAGCo	Every year
<b><u>Medium-Term</u></b>		
Continue short-term programs	Town/LAGCo	Ongoing
Inert recovery program with user incentives	Town/LAGCo	October 1996
Canside recycling expand materials collected	Town/LAGCo	January 1996

The Town of Los Altos Hills will review the possibility of adopting an anti-scavenging ordinance to deter the unauthorized removal of recyclables from recycling collection programs.

**Table 3-4  
Recycling Implementation Costs**

Selected Program Alternatives	Annual Cost to Town	Revenues to Town	Revenue Source Covering Costs
<b><u>Short-Term</u></b>			
Canside recycling	\$60/house	\$0	Residential collection rates
Inert Diversion	\$0	\$0	Debris-box users
Reviewing of other options	Unknown	Unknown	Franchise and Disposal Fees
<b><u>Medium-Term</u></b>			
Inert diversion program	\$0	\$0	Debris-box users
Expand recycling program	\$0	\$0	residential collection rates

## Monitoring and Evaluation

To ensure that the selected recycling alternatives are meeting the goals and objectives of this component, the Town will implement a monitoring and evaluation program. Because the objectives of this component extend throughout both the short-term and medium-term planning periods, the Town's monitoring and evaluation program will continue, as needed, during both planning periods.

**Monitoring Methods:** The methods for quantifying and monitoring the achievement of the component objectives are presented below in three groups: Objective 1; Objectives 2,3, and 4; and Objectives 5,6, and 7.

**Objective 1: Expand participation in residential recycling programs.**

Monitoring Method: An annual survey of residences will be conducted to ascertain the participation rates for recycling programs, the general level of awareness regarding recycling issues, and the level of satisfaction with the community's programs.

**Objective 2: Increase the number of material types collected from the residential and commercial sectors.**

**Objective 3: Review and if feasible expand a diversion program for materials currently collected via construction debris boxes.**

**Objective 4: Divert inert solids generated by the Town's department of public works and capital improvement projects, when feasible.**

Monitoring Method: Further waste characterization studies may be conducted at the end of the short-term planning period to measure changes in both waste type and waste quantities. These studies, will be combined with more informal "spot check" assessments of waste composition to monitor changes in material types recycled, as well as program effectiveness. This will be aided by improved record keeping on the quantity, waste type, and generators of recovered materials.

**Objective 5: Increase local demand for materials made from post-consumer waste.**

**Objective 6: Increase plastics recycling operations when economically feasible to include a wider variety of polymer types.**

**Objective 7: Review economics of recycling operations.**

Monitoring Method: The Town will continually monitor national trends in recycling with respect to new technologies, processes, and market development.

**Written Criteria:** The Town will prepare annual reports describing the findings of the monitoring activities described above. The reports will provide

written criteria evaluating the effectiveness of the recycling programs by reporting on whether (1) the recycling objectives are being achieved; (2) the selected programs and activities were implemented on schedule; (3) business procurement practices have changed; and (4) residents increasingly participate in and have a greater understanding of recycling.

**Responsibility For Monitoring:** The monitoring and evaluation activities described in this section will be implemented by the Town and assisted by hauling company staff.

**Funding Requirements:** Funding for the monitoring and evaluation program described in this section will be provided by the Town through monies collected through disposal fees. Funding for this program includes the costs of (1) administrative activities, (2) record-keeping, (3) program monitoring and surveying, (4) tracking of survey results, and (5) annual report-writing. Annual cost to the Town throughout the short-term planning period is estimated at \$2,000 per year. A further discussion of costs to include estimated operating costs is included in the Funding Component.

**Contingency Measures:** If the programs described above fail to meet the goals and objectives of this component, the following tasks can be implemented:

- Analyze existing programs and alternatives for obstacles to successful implementation.
- Modify selected alternatives, including degree, scope, or extent of recycling activity and implementation schedule.
- Seek additional funding and staff.
- Consider pooling resources with other cities or counties in order to market materials cooperatively.
- Investigate the existing collection and processing activities to be sure that materials are being prepared properly to meet buyer's specifications.
- Evaluate public education efforts to determine whether they need to be increased to broaden awareness of, and participation in, recycling programs.
- Evaluate alternative markets for recovered materials.
- Address issues resulting from surveys that could potentially be affecting diversion goals.
- Consider regulatory programs or mandatory programs such as:
  - Town ordinance making recycling mandatory.
  - A rate structure modification.
  - More aggressive procurement ordinances.
- Select additional alternatives

**Recycling Collectors and Brokers that Responded to the  
County of Santa Clara Recycling Survey  
(January/February 1991)**

- |  |   |
|--|---|
| <p>1. Circo Recyclers<br/>(Commercial Recycler)<br/>6565 Smith Avenue<br/>Newark, California 94560<br/>(415) 791-6980</p>                              | <p>2. Elder's MPI, Inc.<br/>(Reclaimers of Precious metals)<br/>1919 Lundy Avenue<br/>San Jose, California 95131<br/>(408) 432-8870</p>         |
| <p>3. Foothill Disposal Company<br/>(Collector/Hauler, Buy-Back Center)<br/>935 Terra Bella<br/>Mountain View, California 94043<br/>(415) 967-3034</p> | <p>4. Harris Recycling, Inc.<br/>(Collector/ Wood Waste Chipper)<br/>787 "E" North King Road<br/>San Jose, California<br/>(408) 259-2290</p>    |
| <p>5. Oakland Plastic Sales<br/>9733 San Leandro Street<br/>Oakland, California 94603<br/>(415) 562-6033</p>   | <p>6. Reynolds Aluminum<br/>(Buy-Back Center)<br/>1303 Story Road<br/>San Jose, California<br/>(408) 651-6808</p>                               |
| <p>7. Sears Automotive Center<br/>(Commercial Recycling)<br/>10101 N. Wolfe Road<br/>Cupertino, California 95014<br/>(408) 255-0222</p>                | <p>8. Security Shredding Co., Inc.<br/>1045 Commercial Court<br/>San Jose, California<br/>(408) 452-5996</p>                                    |
| <p>9. St.. Francis Cabrini Church<br/>15333 Woodard Road<br/>San Jose, California 95124<br/>(408) 371-3090</p>   | <p>10. Trinie Martin Recyclers<br/>(Buy-Back Center)<br/>8565 1/2 Monterey Road<br/>Gilroy, California 95020<br/>(408) 842-2565</p>             |
| <p>11. West Coast Metal Processing, Inc.<br/>(Broker/Scrap Metal Dealer)<br/>1483 Salmon Way<br/>Hayward, California 94544<br/>(415) 489-8141</p>      | <p>12. Free Flow Packaging Corp.<br/>(Buy-Back Center)<br/>1093 Charter Street<br/>Redwood City, California<br/>(415) 364-1145</p>              |
| <p>13. Raisch Products<br/>(Asphalt/Concrete Recycler)<br/>P.O. Box 543<br/>San Jose, California 95106<br/>(408) 227-9222</p>                          | <p>14. Ciardella Garden Supply, Inc.<br/>(Garden Materials Recycler)<br/>2027 E. Bayshore<br/>Palo Alto, California<br/>(415) 321-5913</p>      |
| <p>15. Waste Fibre Recovery<br/>(Demolition Debris Recycler)<br/>1900 W. Winton Avenue<br/>Hayward, California 94545<br/>(415) 732-wood</p>            | <p>16. Contain-A-Way<br/>(Buy-Back Center)<br/>20/20 Recycle Centers<br/>1731 Pomona Avenue<br/>Corona, California 91720<br/>(714) 279-2200</p> |

- |   |  |
|---|--|
| <p>17. Encore<br/>(End Market/Manufacturer)<br/>860 S. 19th Street<br/>Richmond, California 94804<br/>(415) 234-5670</p> <p>19. Goodwill Industries of Santa Clara Co.<br/>(Buy-Back Donation Center)<br/>1080 North Seventh Street<br/>San Jose, California 95112<br/>(408) 998-5774</p> <p>21. L &amp; K Debris Box Service<br/>(Commercial Hauler/<br/>Wood Waste Chipper)<br/>1313 Armstrong Street<br/>San Francisco, California 94124<br/>(415) 824-4322</p> <p>23. Battery Center<br/>(Buy-Back and Donation Center)<br/>1552 Old Bayshore Highway<br/>San Jose, California 95112<br/>(408) 453-5438</p> | <p>18. Oxford Tire Recycling<br/>(Tire Recyclers)<br/>33950 7th Street<br/>Union City, California 94587<br/>1-800-992-3553</p> <p>20. Western Recycling<br/>(Scrap Metal Dealer)<br/>91 E. 4th Street<br/>Morgan Hill, California<br/>(408) 779-1781</p> <p>22. EMS<br/>(Broker)<br/>231 Fallon Street<br/>Oakland, California 94607<br/>(510) 763-0101</p> <p>24. Town of Los Gatos<br/>(Donation Center)<br/>P.O. Box 949<br/>Los Gatos, California 95030<br/>(408) 354-6809</p> |
|---|--|

**The type of business is provided in parenthesis when available.**

FOOTNOTES\*\*\*\*\*

<sup>1</sup>"A Force in De-tinning," by Tom Watson, *Resource Recovery* January/February 1989, p. 18.

<sup>2</sup>Watson, p. 18.

<sup>3</sup>"The Steel Can's Push for Recycling Respect," by Michael Misner, *Waste Age*, February 1991, p. 69.

<sup>4</sup>Misner, P. 70.

<sup>5</sup>Recyclable Steel Cans: An Integral Part of Your Curbside Recycling Program. *Steel Can Recycling Institute*, Summer 1990, p. 14.

<sup>6</sup>"Progress in Plastics Recycling", by Jim Glenn, *BioCycle*, December 1990, p. 53.

<sup>7</sup>All Plastics Are Not Created Equal, by Jerry Powell. *Resource Recycling*, May 1990, p. 41.

<sup>8</sup>"Plastic Grocery Sack Recycling," by Arthur Amidon, *Resource Recycling*, November 1990, p. 24.

<sup>9</sup>"Dow and Sealed Air Join to Recycle LDPE Scrap," by Susan Combs, *Recycling Times*, January 29, 1991, p. 9.

DIVERSION QUANTITIES  
(TONS, 1991)

	SOURCE REDUCTION	CURBSIDE	APARTMENT RECYCLING	DROP-OFF	BUY-BACK	29/20 CENTERS		COMPOSTING	TOTAL WITH/OUT TRANSFORMATION		PERCENT DIVERTED
						TRANSFORMATION	TRANSFORMATION		TRANSFORMATION	TRANSFORMATION	
<b>PAPER</b>											
corrugated containers	0.0	560.0	0.0	0.0	0.0	0.0	0.0	0.0	560.0	0.0	0.0%
newsprint	0.0	435.0	0.0	0.0	0.0	0.0	0.0	0.0	435.0	0.0	17.9%
high grade ledger paper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
mixed paper	0.0	125.0	0.0	0.0	0.0	0.0	0.0	0.0	125.0	0.0	5.1%
other paper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
<b>PLASTICS</b>											
HDPE containers	0.0	32.8	0.0	0.0	0.0	0.0	0.0	0.0	32.8	0.0	1.3%
PET containers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
film plastics	0.0	32.8	0.0	0.0	0.0	0.0	0.0	0.0	32.8	0.0	1.3%
other plastics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
<b>GLASS</b>											
refillable bev. containers	0.0	388.4	0.0	0.0	0.0	0.0	0.0	0.0	388.4	0.0	16.0%
CA Redemption Value	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
other recyclable glass	0.0	233.0	0.0	0.0	0.0	0.0	0.0	0.0	233.0	0.0	9.6%
other non-recyclable glass	0.0	155.4	0.0	0.0	0.0	0.0	0.0	0.0	155.4	0.0	6.4%
<b>METALS</b>											
aluminum cans	0.0	1282.0	0.0	7.9	0.0	0.0	0.0	0.0	1337	0.0	5.3%
bi-metal containers	0.0	98.5	0.0	0.0	0.0	0.0	0.0	0.0	98.5	0.0	4.0%
tin cans	0.0	27.3	0.0	0.0	0.0	0.0	0.0	0.0	27.3	0.0	1.1%
other ferrous	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
other aluminum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
other non-ferrous	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
white goods	0.0	0.0	0.0	7.9	0.0	0.0	0.0	0.0	7.9	0.0	0.3%
<b>YARD WASTE</b>											
	0.0	0.0	0.0	1282.0	0.0	0.0	0.0	0.0	1282.0	0.0	52.7%
<b>OTHER ORGANICS</b>											
food waste	34.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.1	0.0	1.4%
trees/rubber	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
wood wastes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
agricultural crop residues	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
manure	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
textiles/leather	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
diapers	34.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.1	0.0	1.4%
other misc. organics	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.1%
<b>OTHER WASTES</b>											
inert solids	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
batteries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
other HHWS	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.1%
<b>SPECIAL WASTES</b>											
ash	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0%
sewage sludge	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
industrial sludge	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
asbestos	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
auto shredder waste	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
auto bodies	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
mattresses	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
a) other special waste	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0%
<b>TOTAL</b>	34.1	1107.0	0.0	1292.0	0.0	0.0	0.0	0.0	2433.1	0.0	100.0%

a) Dead animals

# COMPOSTING COMPONENT

## Introduction

A well designed and operated composting program can play a major role in the overall success of a solid waste management strategy. As such, composting will be a major contributor to Los Altos Hills' goals of 25 percent source reduction and recycling by 1995, and 50 percent by 2000. Composting is the biological degradation of organic matter under controlled conditions to produce a usable soil amendment. The results of the waste disposal characterization analysis indicate that a significant amount of the Los Altos Hills municipal solid waste consists of compostable material. Therefore, composting is potentially a primary means of managing solid waste.

Reliance on composting as a major component of a solid waste management plan has several environmental and economic benefits. Economic benefits of composting may include one or more of the following:

- Avoided disposal costs;
- Reduced solid waste processing costs;
- Reduced demand on landfill capacity;
- Delayed need to incur capital costs of new landfill acquisition;
- Reduced expenditure on organic soil amendments.

Potential environmental benefits may include any or all of the following:

- Landfill space savings;
- Conservation of a valuable natural resource;
- Improved soil fertility and enhanced aesthetics through the application of compost;
- Reduced leachate strength from landfills.

Furthermore, legislative impetus toward composting resulting from regulatory bans on the continued landfilling of yard wastes or ambitious landfill diversion goals provides an additional justification for aggressively pursuing composting at this time.

This component of the plan first outlines the short- and medium-term objectives of the composting plan, as well as the status of composting programs currently underway. It then provides a summary of the various composting strategies that

will be adopted, and presents a discussion for program evaluation, implementation and monitoring.

It should be noted that a detailed discussion of the technical and procedural guidelines for composting is beyond the scope of this document. More in-depth, technical discussions of composting methods can be found in References 1 to 5 at the end of this section.

## **Objectives**

This section describes short- and medium-term objectives for Los Altos Hills' composting program. The program includes diversion of organic materials both by composting and by other methods of processing (e.g., the production of wood chips for landscaping purposes).

### **Short-Term Objectives**

- Divert 17 percent (1493 tons) by weight of the total waste stream generated.
- Examine possibilities for regional composting and curbside collection of yard waste.
- Continue to inform and educate residents about how to participate in the yard waste drop-off program.
- Continue with franchised disposal company, to identify particular subgroups of potential end users and their anticipated product quality and quantity demands.
- Maintain yard waste drop-off site at a convenient location.
- If deemed feasible study full-scale mixed MSW composting, sewage sludge composting, or mixed MSW/sludge co-composting for medium- to long-term implementation, in conjunction with neighboring cities using the same disposal sites.
- Inform residents through education of the availability of compost products.
- Encourage, via the Source Reduction Component, residential backyard composting.

### **Medium-Term Objectives**

Objectives for the medium-term planning period include:

- Divert 19.5 percent (1765 tons) by weight of the total generated waste stream.

- Refine the yard and wood waste collection and processing systems as needed.
- Study a food and food processing waste collection and composting program.
- Study the feasibility of co-composting yard waste with other organic residues, including sewage sludge.
- Divert self-haul yard waste into a composting program.
- Encourage use of compost by local and regional parks and highway departments and other public entities.

## Existing Conditions

The results of the disposed waste analysis indicate that for the year 1991, disposed yard waste amounted to approximately 796 tons. The sources of the material were residential collection, industrial (debris boxes) and self-haul. The amount of compostable materials generated in the Town in 1991 was calculated to be approximately 2078 tons.

Compostable waste materials from the residential sector in Los Altos Hills that are not re-used in residential backyards are currently hauled by residents to a yard waste drop-off site, or else removed with other refuse by the Town's franchised disposal company. Yard waste has also been collected at seasonal cleanup days, but the tonnages gathered during these events has been reduced due to the implementation of the drop-off program. The yard waste and other biodegradable organic materials collected from the residential sector are taken to Zanker Road Landfill, where they are sorted for a wide variety of uses, including compost, mulch, ground cover and wood chips.

Organic waste collected by the Town's maintenance department is chipped and used in Town parks and other municipal properties. Because this material does not enter the disposable waste stream, no tonnage data is available.

The diversion of compostable wastes in 1991 from residential waste sources is estimated to be 15% (1282 tons annually). The material categories comprising the diversion are: yard and wood waste, (100%, 1282 tons annually).

The yard waste drop-off and seasonal clean-up days are the sole contributors to Los Altos Hills' composting efforts. Compostable materials are currently being processed at the following site:

Name:	Zanker Road Landfill
Location:	San Jose
Method of Processing:	composting, recycling
Quantity Recycled:	1282 tons annually

## **Program Alternatives**

The following discussion examines various short-term and medium-term composting options in Los Altos Hills. Los Altos Hills is a small, predominantly residential community. Consequently, alternatives are limited, and must be examined accordingly. Composting is a three part process, starting with the collection of compostable materials, followed by actual composting, and ending with distribution of composted products. This section examines various ways in which Los Altos Hills can improve its performance within these three processes. In some cases, alternatives overlap the different processes associated with recycling, and while different alternatives are examined independently, the best composting system may require implementation of two or more alternatives concurrently.

### **Collection Options**

For Los Altos Hills, two collection alternatives are proposed. The first alternative is to continue the permanent drop-off center program. The second alternative examined is the implementation of a curbside, or canside collection program. A mobile collection program was also considered, but due to the small size of the Town, a permanent drop-off site functions similarly to a mobile site, at a substantially reduced cost. Thus, the option for a mobile drop-off center is not evaluated for Los Altos Hills.

### **Alternative 1 - Continuation of Permanent Drop-Off Center Program**

A drop-off program relies on residents and/or private commercial haulers to transport clean yard and wood waste to a designated site. This type of program keeps collection costs low, but generally results in less volume recovered than in a curbside collection program. This is a primary or sole collection method typically used in sparsely populated areas. If population density is sufficiently high, a drop-off program can be supplemented by both a curbside collection and by a backyard composting program, for maximum recovery of yard wastes. Los Altos Hills has successfully been using a yard waste drop-off program since September 1990.

Key planning features for a permanent yard waste drop-off site include the following:

- A drop-off center can be more easily located at a landfill, transfer station, or at a MRF.
- Sites can be open only a few days a week, such as one or two weekdays and on Saturdays, to minimize staff time.
- Sites should only accept source-separated or uncontaminated yard and wood wastes.

- Materials should be delivered in loose form [or in biodegradable paper bags].
- A conveniently-located receptacle should be provided so that residents can dispose of their plastic bags or other containers used to transport yard waste to the site.
- Instructional signs should be placed at the site to indicate acceptable materials, unloading location, and site hours.
- Acceptable materials should include leaves, grass clippings, brush, and branches less than 6 inches in diameter. Stumps and branches over 6 inches in diameter, and construction and demolition wood should not be accepted.
- If necessary, and if economically feasible, a tipping fee for commercial haulers and residential self-haul should be set at 25% to 50% less than tipping fees at disposal sites in the region.
- One employee per site should monitor the site during hours of public access for quality control and organization and to ensure that the site is only being used by those "users" who it is intended for.

## **Alternative 2 - Residential Canside Collection**

Los Altos Hills already employs a canside recycling service for residents, which collects recyclables in back-yards. Residents can choose to place recyclables at curbside for a reduced cost. Yard waste could be added to the materials collected. The yard waste generated in Los Altos Hills is estimated to consist of approximately 60% by weight brush and other woody materials, and 40% by weight leaves and grass. Any canside or curbside collection system must be capable of handling these materials regularly and efficiently.

There are three main options for setting out yard waste in a residential canside collection program:

- bagged;
- loose yard waste raked into street or to curb;
- designated rigid containers.

Advantages of containerized (versus loose) yard waste set-out include: 1) no significant behavior change is required of residents; and 2) standard existing waste collection vehicles can be used to collect yard waste. Disadvantages include: 1) de-bagging may be necessary; 2) collection crews may need to lift heavy bags or other containers; and 3) potential contaminants are hidden from view. By contrast, collection of loose yard waste requires no de-bagging and does not cause collection crew strain from lifting heavy objects. However, collection of loose materials may be more labor-intensive and more costly, may require parking regulations, and may result in residue left on the street.

The inclusion of more highly putrescible types of compostable materials (e.g., food wastes) in the residential curbside collection program would necessitate the use of a containerized collection system and a collection frequency of no less than once per week. The quantities and characteristics of the feedstock (the materials recycled) are important considerations in determining the type of container.

Mixed MSW is being processed at several facilities in the U.S. for composting. The processing methodology varies among the facilities, but typically involves a series of processes such as size reduction, magnetic separation, air classification, and screening. Although the quality of the compost produced from mixed MSW is generally not as good as that produced from source separated compostables (e.g., yard waste), this type of program has the advantage of not requiring that the material be source separated.

## **Compost Processing Alternatives**

The second stage of a composting program is compost processing. For Los Altos Hills, two processing alternatives are discussed. The first alternative is to maintain the existing program, with yard waste being sent to Zanker Road Landfill or another processing site for composting. The second alternative is to establish a composting site in or near the Town of Los Altos Hills.

### **Alternative 1 - Continued Processing at Outside Facility**

Los Altos Hills can continue to send its yard waste to the Zanker Road Landfill, or to another outside processing site. A larger, independently run facility experiences economies of scale, and can better manage the processing and marketing of compostable materials than smaller sites. Disadvantages of hauling yard waste for composting include high transportation costs, and the removal of nutrients from the community vegetation cycle.

### **Alternative 2 - Establishment of an in Town or Nearby Regional Composting Site**

The Town of Los Altos Hills has the option of pursuing an in-Town composting facility. Yard waste collected at the current drop-off site could be transported to a local composting facility at reduced costs, or yard-waste could be brought directly to a local site at further savings. A local composting site would require much land and would result in increased noise, particulates, and odors in the vicinity of the facility.

A local site could be either publicly or privately owned. A privately-owned and -operated (or publicly-owned and privately-operated) processing site has several advantages, including:

- reduced allocation of staff and equipment by public sector;
- no public sector need to identify and develop composting facility (if privately-owned);

- contractually fixed or per unit fee for processing services;
- private responsibility for marketing of end-products;
- better control over operating costs (if publicly owned).

There are several composting methods available should the Town desire to open its own facility, ranging from low to highly complex technology. The **turned windrow** method of composting calls for stacking wastes into elongated piles known as windrows. This relatively simple method of composting generally requires between 6 and 18 weeks to finish, and can process large quantities of material at a competitive cost with other solid waste disposal options. The **aerated static pile or forced aeration** method of composting is similar to the turned windrow method, except that oxygen is supplied to the windrows through a network of pipes and blowers that either force or draw air through the composting matter, rather than through turning. This method is more expensive than the turned windrow technique, yet has the advantage of being able to process sewage sludge, and generally poorer quality materials. **In-vessel composting** entails the use of fully or partly enclosed vessels in which decomposition takes place under closely monitored conditions. This method of composting is capable of producing a high quality end-product, but its expense makes it unattractive as a primary management option for yard wastes.

Wood products and bulky yard waste can be shredded and added to composting piles, or can be used independently as mulch, path lining, or ground cover.

## **Market Development**

The final phase of a composting program is the marketing and subsequent re-use of composted materials. Markets will be identified and established for the end-products from the selected composting program. The market plan will identify the end-products and the quality standards. Quality standards are very important in the marketing of end-products.

Currently, Zanker Road Landfill markets and distributes the compost produced from Los Altos Hills yard waste. Should Los Altos Hills run its own program, homeowners, municipal and county agencies, nurseries, sod farms, and landscaping supply firms would all be potential end users. It would also be necessary to determine how the end-products would be distributed (i.e., bagged and/or bulk) and at what, if any, cost.

The plan could also include development of markets outside the immediate area. Los Altos Hills could explore the possibility of cooperating with other jurisdictions to market end-products. Marketing alternatives will be explored when and if the need arises. The Town of Los Altos Hills will continue to inform the public about compostable products and their uses in the yard.

## **Additional Program Requirements**

The following concerns should also be considered depending on which alternatives are eventually chosen and implemented.

## **Public Information and Education**

In order to have a successful composting program, the public will need to be informed as to the benefits of the collection program, the benefits of using compost products, and how to obtain town-generated compost and other end products. The Education and Public Information Component covers in greater detail the process of educating and informing the public.

Once it has been determined what end-products will be generated, the cost to the public, and how the individual products will be made available, then a separate information program should be developed and implemented. This will be an important aspect of the overall composting component because the Town should be able to dispose of the finished products, especially if composting occurs within Town limits.

## **Evaluation of Rates**

In order to improve the overall quality of end-products, the Town, during its annual review of rates, should study the effect of rates on assuring high-quality compost products. It may be more cost-effective to have source-separated yard waste or other compostable feedstocks. This would allow for improved quality of end-products. Adjustment to certain rates (e.g., variable-rate residential collection, reduced rates for clean self-haul loads) might encourage this.

## **Evaluation of Alternatives**

Each of the above alternatives is evaluated for implementation in Los Altos Hills. All collection and processing alternatives are evaluated according to state mandated criteria. Table 4-1 (see Appendix C) assigns ratings for each criteria for all options examined. A rating of "high" corresponds to a favorable evaluation. A rating of "medium" corresponds to a non-negative evaluation. A rating of "low" corresponds to a negative evaluation.

## **Collection Alternatives**

### **Alternative 1 - Continuation of Drop-off Program**

A drop-off program has already been implemented in Los Altos Hills. Yard waste is self-hauled by individual residents to the local drop-off center, then transferred to a recycling center. The current program has been extremely successful.

To encourage self-haul, residents should continue to be allowed to use the drop-off site at no or minimal cost, and could be given a voucher for finished compost. Self-hauling reduces overall costs of collection. Materials included in the current or any future drop-off program should be limited to yard or wood waste that is recyclable at current or future centers.

**Waste Diversion Potential:** The potential diversion could improve to 90 percent through education. This figure represents a high degree of waste stream diversion.

**Absence of Hazards:** This option does not present any extraordinary hazards, other than those associated with movement of yard wastes to the drop-off center.

**Flexibility:** This program can be changed relatively easily, and has already undergone several modifications to account for economic and social factors. The current drop-off program would be highly flexible in handling other changes within the community.

**Shifts in Waste Type Generation:** Composting programs only affect movement of the waste-stream, not composition.

**Ease of Implementation:** This program is already implemented, and consequently represents the most easily implemented option.

**Facility Needs:** Currently, one drop-off site serves the entire Town. The Town owns this lot, and does not realize any lost revenue from its use as a drop-off site.

**Consistency with Local Policies:** This program has been implemented to comply with all local policies.

**Absence of Institutional Barriers:** There are no institutional barriers to this program.

**Estimated Cost:** Current costs of the program are \$3000/month, or \$30/ton. This includes a \$10/ton disposal cost, making collection and transportation costs \$20/ton.

**End Uses:** The yard waste generated from this program is recycled for a variety of uses such as compost, mulch and ground cover, at Zanker Road Landfill.

## **Alternative 2 - Residential Canside or Curbside Collection**

General advantages of canside or curbside collection over drop-off programs for yard waste or other compostables include: 1) convenience for residents; 2) high community profile and awareness; 3) high participation and recovery rates; and 4) linkage with mixed waste collection.

Disadvantages of canside or curbside collection for yard waste or other compostables include: 1) higher cost; 2) greater complexity; and 3) longer implementation time than with a drop-off program.

**Waste Diversion Potential.** Canside/curbside removal is generally very effective. However, due to the length of Los Altos Hills driveways, and the size of yard waste loads associated with large lots, this practice might not realize any better results than the current drop-off program. However, like the drop-off program, a canside or curbside collection program would be effective in diverting waste.

**Absence of Hazards:** This alternative does not present any extraordinary hazards beyond those associated with normal refuse collection.

**Flexibility:** Due to high capital costs for curbside or curbside pick-up in Los Altos Hills, this program will only be moderately flexible in adjusting to changing economic, social, and technological conditions.

**Shifts in Waste Type Generation:** Composting programs only affect movement of the waste-stream, not composition.

**Ease of Implementation:** This option could be implemented reasonably easily, but at a high cost.

**Facility Needs:** Beyond collection equipment, there are no additional facility needs associated with this alternative.

**Consistency with Local Policies:** This option is in line with and consistent with existing policies and operations.

**Absence of Institutional Barriers:** There are no institutional barriers to this program.

**Estimated Cost:** Due to the low density nature of Los Altos Hills, costs of implementing a curbside program would be moderate to high.

**End Uses:** Yard waste from this program, like waste from the current drop-off program, would be recycled in the most efficient manner possible for a variety of different uses such as compost, mulch and ground cover.

## **Processing Alternatives**

### **Alternative 1 - Continued Composting at Outside Facilities**

**Waste Diversion Potential:** Composting operations at Zanker Road Landfill can accept as much yard waste as Los Altos Hills can produce. Collection processes, not processing constraints, are the limiting factors in Los Altos Hills' yard waste program.

**Absence of Hazards:** Transportation of wastes is the only hazard associated with the current program. The composting process itself does not present any great hazards. Facilities need to maintain compost piles at a reasonable temperature.

**Flexibility:** The current program is flexible in dealing with normal economic, social, and technological variations that affect yard waste composting.

**Shifts in Waste Type Generation:** Composting programs only affect movement of the waste-stream, not composition.

**Ease of Implementation:** This program has already been implemented.

**Facility Needs:** Besides the drop-off site, no public facilities are needed for this program.

**Consistency with Local Policies:** Local policies are not violated by the current program.

**Absence of Institutional Barriers:** There are no institutional barriers to this program.

**Estimated Cost:** The current cost to the Town for the entire yard waste program, including drop-off, transportation, and composting, is approximately \$30/ton.

**End Uses:** Materials sent to Zanker Road Landfill are composted, and have a wide variety of residential and commercial applications including compost, mulch and ground cover applications.

## **Alternative 2 - Establishment of an in Town or Nearby Regional Composting Site**

While Los Altos Hills currently has no composting facilities within its Town limits, it is conceivable that at some time in the future, the Town, or citizens within the Town, will provide a composting service. In the event that such a service is provided, one of the above mentioned composting methods will most likely be adopted. Specific composting options are not individually evaluated, as evaluation should occur at the time that such a project is implemented.

Should Los Altos Hills desire to establish its own composting facility, several options should be considered for site selection. In addition to the material presented here, please refer to the discussion on facility siting. The availability of suitable sites for composting may pose a major barrier to proceeding with operations. Technical, regulatory, economic, political, social, and environmental factors all play a role in the siting process. Potential sites may include:

- Unused portions or completed sections of existing landfills and other solid waste facilities such as transfer stations;
- Unused portions of wastewater treatment facilities;
- Large, unused areas;
- Buffer areas around industrial sites and institutions, including airports;
- Utility rights-of-way;
- Privately owned land;
- Municipally owned land used for buffer areas or storage.

Factors to consider when evaluating potential sites are dependent upon local environmental and development regulations, state requirements, and the specific concerns relevant to the proposed site. Generally, factors may include:

- Proximity to waste stream;
- Proximity to potential markets;
- Availability and cost of the site;
- Accessibility;
- Potential for public acceptance;
- Physical condition of site, including topography, geology, aesthetics, and other factors;
- Availability of utilities;
- Current and planned adjacent land use.

The suitability of a given site will, of course, depend on its intended use. As described above, the various factors must be weighed against the proposed option's ability to divert waste. Specific evaluation of alternative sites should take place at the time a local composting facility is proposed or deemed necessary.

**Waste Diversion Potential:** A local composting site would have to be sufficiently large to deal with a large quantity of yard waste. As long as the facility is adequate, composting operations would be limited by collection activities, and not composting practices.

**Absence of Hazards:** Transportation of wastes presents the primary hazard associated with this program. Noise and particulate emissions in the immediate area would present minor hazards as well. Facilities need to maintain the temperatures of the compost piles at reasonable levels.

**Flexibility:** A small scale, local composting operation may be more susceptible to economic, social, and technological fluctuations than a large scale facility.

**Shifts in Waste Type Generation:** Composting programs only affect movement of the waste-stream, not composition.

**Ease of Implementation:** This program would be difficult to implement, due to high capital costs, and permitting processes.

**Facility Needs:** A local composting operation would require a large piece of land, as well as a significant amount of equipment.

**Consistency with Local Policies:** Local policies concerning noise, air pollution, and traffic may hamper the implementation of this option. Additionally, zoning conditions in the Town preclude commercial uses except for specific conditional uses.

**Absence of Institutional Barriers:** The Town does not currently own land that is of sufficient size for a composting operation. Furthermore, the policy constraints mentioned above would act as a barrier to private development of a composting facility.

**Estimated Cost:** Costs of this program would be dependent on capital costs, especially for land. Transportation costs would be less than they are currently, but start-up costs would be significant. Estimated costs of operating a facility are moderate. Some or all of this cost could be offset by proceeds from the sale of composted materials. Potential revenue from a composting program would be largely dependent upon an operation's ability to define and establish a market.

**End Uses:** Materials would be composted, and would have a wide variety of residential and commercial applications including compost, mulch and ground cover applications.

## **Siting Alternatives**

A privately-owned and -operated (or publicly-owned and privately-operated) processing site has several advantages, including:

- reduced allocation of staff and equipment by public sector;
- no public sector need to identify and develop composting facility (if privately-owned);
- contractually fixed or per unit fee for processing services;
- private responsibility for marketing of end-products;
- better control over operating costs (if publicly owned).

### **Disadvantages of this option include:**

- limited public sector control over end-product outlets;
- possibly greater transport time and cost from collection point to processing (if privately-owned and located in another jurisdiction).

## **CEQA Requirements**

As a component of the overall SRRE, the selected composting program(s) will require an environmental review under the California Environmental Quality Act (CEQA). The environmental impacts of both collection and processing systems would require analysis. Depending upon the quantity and types of materials collected and processed, and the magnitude of potential environmental impacts, a negative declaration or an environmental impact report (EIR) would be prepared.

## **Distribution and Marketing**

Distribution and marketing of the end-products of the composting program is the critical link in a successful plan. Whether processed in Los Altos Hills, or at a facility outside of the Town, a successful plan requires that demand for composted products approximately equals supply. Most programs will produce one or more of the following products for distribution and marketing:

**Compost:** used primarily as a soil conditioner, secondarily as a minor source of macro and micro nutrients, to aid in the ability of soil to retain water, and as an ingredient in commercial top soil and potting soil blends;

**Mulch:** used to retard weed growth, lessen water loss, and stabilize soil temperature;

**Wood Chips:** serves as a mulch or top dressing, a bulking agent for sludge composting, and as a boiler fuel.

In general, the markets for mulch and wood chips are well developed and predictable. However, compost markets are less mature, and considerable effort should be put into ensuring a reliable outlet for any compost product, prior to program implementation. This program will first determine the specifications of the various materials that will be produced. This will be followed by the identification of the potential end-users for these products. The quality of the feedstock, the degree of source separation, and the processing methods ultimately selected will determine the quality and quantity of the different materials that will be produced, and therefore, the likely markets for them.

Quality constraints associated with compost can include:

- Maturity - material has not fully decomposed;
- Contaminants - presence of sticks, stones, plastic, metals, etc.;
- Low nutrient content - lack of value as fertilizer;
- Heterogeneity - lack of consistent, appropriate particle size;
- Soluble salts and improper pH - can limit use in nursery/potting mixes;
- Unappealing appearance - can limit acceptability.

Compost quality (good appearance, low concentrations of metals and toxic compounds, etc.) will be assured by thorough source separation, careful processing of the feedstock, and regular testing of the end-product. Although a high quality product generally assures more successful marketing, knowledge of the end-users will allow the production of a material of appropriate quality for its intended use. It is possible that the program may lead to the production of two types of composts having different quality. For example, nurseries demand a very high quality product, while highway departments can utilize a lower quality product.

The following are potential end-users of compost products in Los Altos Hills and Santa Clara County:

- local parks and highway departments;
- homeowners;
- greenhouses;

- landscapers;
- farmers and farm suppliers;
- golf courses;
- sod growers;
- cemeteries;
- schools;
- parks;
- public buildings.

If supply exceeds demand, public users of soil amendments can be mandated to give preferential treatment to compost products. The municipality will also consider giving the product away free to homeowners and landscapers willing to pick it up. Specific marketing alternatives should again be addressed independently as the need warrants. The Town of Los Altos Hills will make an effort to educate the public about the availability and advantages of composted products. If an in-Town or nearby composting operation were established, the Town would attempt to define potential markets for usable products.

## **Program Selection**

The following programs were selected for implementation based on evaluation of the various alternatives. Table 4-1 (see Appendix C) depicts the evaluation results for the composting alternatives discussed above. In most cases, programs have been selected that compliment or enhance Los Altos Hills' current composting program, which has been extremely successful.

### **Short-Term**

In order to meet short-term goals, an estimated diversion of 17% by weight (1475 tons) of the total generated waste stream will be necessary. The programs to achieve this goal are:

- Continue the residential yard waste drop-off program (Collection and Processing Alternative 1), with compostable materials going to a centralized composting facility and/or other solid waste facility. This program currently accounts for a diversion rate of 15 percent (1282 tons), however with increased participation and public awareness of the program the diversion rate is anticipated to increase to 17% (1493 tons annually) through the short-term planning period. Selection is based on ease of implementation and on cost-effectiveness.
- Examine the possibility of developing a regional compost processing facility (Processing Alternative 2). Yard and wood wastes would be shredded and/or composted. A study will have to be carried out in order

to determine the most appropriate composting program. The composting program will be designed such that additional materials could be composted or shredded. Los Altos Hills would work with other local communities to take advantage of economies of scale.

- Disseminate public education and publicity materials regarding yard waste drop-off, home composting, and other yard waste reduction strategies. Refer to the Education and Public Information Component. The success of the program depends, to a great extent, upon how successfully the public is informed and educated. Public information could address the marketing aspect of the end-products; compost, mulch and wood chips.
- Evaluate the possibility for curbside or backyard collection of yard waste (Collection Alternative 2).

### **Medium-Term**

For the medium-term, an estimated diversion rate of 19.5 percent (1765 tons) of the total generated waste stream will be necessary. The following programs to achieve this goal are flexible, and should be evaluated as need arises to insure that the best option is pursued given future conditions. The selected programs are:

- Continue the residential yard waste drop-off program (Collection and Processing Alternative 1). The program goal is a diversion of 19.5% of the total generated waste stream. The program is an ongoing one, and therefore any incremental costs associated with operating the program should be minimal. The educational programs will also have to be continued.
- If curbside or canside collection of yard waste proves efficient for Los Altos Hills, pursue this option either concurrently with, or in lieu of the drop-off program.
- Continue to educate the community about the need for and means to backyard and community composting of recyclable yard waste.
- If feasible, recommend a multi-jurisdictional study to co-compost yard waste with sewage sludge generated in the Town of Los Altos Hills and other jurisdictions.

### **Cost of Selected Programs**

The following costs are planning level estimates, developed for comparison only. The estimates are based on a number of broad assumptions. The actual costs may vary depending on the individual requirements of specific sites and engineering design.

It is estimated that the selected programs will cost from \$30,000 to \$50,000 per year, or \$30 to \$60 per ton, for the short-term. If on-site residential composting becomes more popular and effective in the future, annual community costs of composting could drop significantly.

## **Program Implementation**

This section identifies and describes the specific government agencies responsible for implementing the selected alternatives and programs, the specific tasks necessary to achieve full implementation of the selected alternatives and programs and an implementation schedule. This information is presented in Table 4-2 on the following page. Los Altos Hills is a small community with limited public resources. Consequently, the scope of possible actions is greatly reduced, and the Town must act accordingly.

The Town will continue to administer the yard waste drop-off program run by the Los Altos Garbage Company. Staff will make sure that the existing system continues to be adequate and efficient. Town staff will also be responsible for evaluating alternative actions, such as curbside or curbside pickup, and development of Town composting facilities.

Town staff and the disposal company will work together to provide information to residents. When appropriate, information will be forwarded to local newspapers. For a further discussion of education options, see the Education and Public Information Component of this report.

Various rate structures for residential garbage will be examined in an effort to encourage composting through monetary incentives.

**Table 4-2  
Composting Program Implementation**

Town = Los Altos Hills Public Works Department  
LAGCo = Los Altos Garbage Company  
County = Santa Clara County

<u>Task</u>	<u>Responsible Agency</u>	<u>Implementation Date</u>
<b>Short-Term</b>		
Continue residential yard waste drop off program	Town/LAGCo	ongoing
Educate residents of the program	Town/LAGCo	ongoing
Educate residents of availability of end-products	Town/LAGCo	ongoing
Evaluate the possibility for curb or canside collection of yard waste	Town/LAGCo	Fall 1994 - 1995
Examine possibility of developing a regional compost processing facility	Town/County	ongoing
Study sewage sludge composting	Town	ongoing
<b>Medium-Term</b>		
Continue residential yard waste drop off program	Town/LAGCo	ongoing
If curb or canside yard waste collection proves efficient pursue program	Town/LAGCo	Spring 1996
Divert self-haul yard waste to composting facility	Town	1997
If practical, study food processing waste collection	Town	1997
If practical, study co-composting yard waste with other organics	Town	1997

## Monitoring and Evaluation

To ensure that the composting program is meeting its goals and objectives, the program will be monitored and evaluated on a regular basis. Monitoring will include the following measures:

- recording at the processing site of the estimated volume (cubic yards) or weight (tons) of materials accepted for processing at the composting site, on a daily basis;
- recording at the processing site of the estimated volume or weight of rejected materials that require disposal after pre- or post-processing, on an as-applicable basis;
- recording by the hauler of the estimated volume or weight of materials collected and accepted at the composting site, on a daily basis;
- review of this information by hauler and Town staff;
- other supplementary measures as deemed necessary or desirable.

A waste generation study will be undertaken by Los Altos Hills at a time agreed upon by the State to evaluate changes in the disposal levels of materials targeted or that could be targeted by the composting program. Data gathered in the waste generation study will be compared with data gathered in a similar study conducted for Los Altos Hills in 1991.

The effectiveness of the composting program (including on-site composting and other organic waste reduction techniques) will be gauged in the medium-term as follows, subject to modification in accordance with State guidelines:

- unsatisfactory - less than 25% diversion of yard and wood waste;
- needs improvement - between 25% and 50% diversion of yard and wood waste;
- satisfactory - between 50% and 75% diversion of yard and wood waste;
- effective - greater than 75% of yard and wood waste.

Evaluating the effectiveness of the composting programs is done annually as a feature of the solid waste franchise rate review.

**Written Criteria:** The Town will prepare annual reports describing the findings of the monitoring activities described above. The reports will provide written criteria evaluating the effectiveness of the composting programs by reporting on whether (1) the composting objectives are being achieved, (2) the selected programs and activities were implemented on schedule, and (3) residents increasingly participate in and have a greater understanding of composting.

**Responsibility for Monitoring:** The monitoring and evaluation activities described in this section will be implemented by the Town and assisted by hauling company staff where appropriate.

**Funding Requirements:** Funding for the monitoring and evaluation programs described in this section will be provided by the Town through costs of (1) administrative activities, (2) record-keeping, (3) program monitoring and surveying and (4) annual report writing. Annual costs to the Town throughout the short-term planning period is estimated at \$0 - \$20,000 per year.

### **Contingency Measures**

If it is determined that projected diversion rates will not be obtained, the community has several alternatives available. An evaluation of all selected programs might show the need for increased public information and educational materials. Los Altos Hills will look at potential measures to increase compost program efficiency, develop strategies for securing additional markets for finished compost products, and determine whether or not to increase diversion of certain compostable materials.

If it is determined that the anticipated diversion rates cannot be achieved, the community will increase diversion rates in one or more of the other components (i.e., curbside or curbside recycling).

## References

1. The BioCycle Guide to Yard Waste Composting, ed. by the Staff of *BioCycle*, The J.G. Press, Emmaus, 1989.
2. Golueke, C.G., Biological Reclamation of Solid Wastes, Rodale Press, Inc., 249 pp., 1977.
3. U.S. Congress, Office of Technology Assessment, Facing America's Trash: What Next for Municipal Solid Waste?, OTA-0-424, U.S. Government Printing Office: Washington, D.C., October 1989.
4. Cal Recovery Systems, Inc., Manual for Composting Yard Wastes and Mixed MSW, Prepared for U.S. Environmental Protection Agency, Draft August 1990.
5. Richard T.L., N.M. Dickson, and S.J. Rowland, Yard Waste Management: A Planning Guide for New York State, New York State Department of Environmental Conservation, Albany, June 1990.
6. Emcon Associates, Waste Diversion Study, prepared for County of Santa Clara, March 4, 1991.



# SPECIAL WASTE COMPONENT

## Introduction

Special waste is solid waste that requires unique handling and disposal methods because of health hazard, environmental impact, or physical characteristics. Special waste is defined in Section 18720, Article 3, Chapter 9, Title 14, California Code of Regulations (CCR). As defined in Section 18720, special waste is any hazardous waste listed in Section 66740 of Title 22 of the CCR, or any waste that has been classified as a special waste pursuant to Section 66744 of Title 22 of the CCR, or "has been granted a variance for the purpose of storage, transportation, treatment, or disposal by the Department of Health Services pursuant to Section 66310 of Title 22 of the CCR. Special waste also includes any solid waste which, because of its source of generation, physical, chemical or biological characteristics, or unique disposal practices, is specifically conditioned in a solid waste facilities permit for handling and/or disposal."

## Typical Special Wastes

Typical special waste types include:

- Sewage sludge
- Ash
- Asbestos
- Used tires
- "White goods"
- Abandoned vehicles
- Dead animals.

Presented below is a brief description of typical special wastes.

**Sewage sludge** is produced by waste water treatment plants during secondary treatment of waste water. In areas where waste water systems service industrial areas, sludges may contain heavy metals and other constituents that can pose hazards to public health. Disposal of sewage sludge in solid waste landfills is becoming more difficult because of stricter landfill regulations.

**Ash** is generated from the combustion of solid waste, such as wood waste and sewage sludge. Ash can be disposed of at a Class III landfill,<sup>1</sup> unless the Department of Health Services (DHS) determines that the waste must be managed at a hazardous waste facility. Because concentrations of metals in ash commonly exceed levels set by the California Department of Health Services, ash is considered to be a California Hazardous Waste and must be managed by a hazardous waste facility. However, the primary means of ash management in the United States is land disposal.

**Asbestos** is a naturally-occurring fibrous substance that has been shown to cause lung cancer and other respiratory problems. Before 1970, asbestos was in widespread use in products such as ceiling and floor tiles, and insulation for pipes, boilers, and ducts. Asbestos is generally classified as friable (hazardous) or non-friable (non-hazardous). Friable, or airborne asbestos is known to have adverse effects on the human lung and poses a potential public health risk when inhaled. It becomes available for inhalation when the material is disturbed in processes such as building repair or maintenance. Friable asbestos in the waste stream is considered a hazardous waste and requires special handling and disposal in a landfill permitted to accept hazardous wastes.

In accordance with Sections 2520 and 2522 of Subchapter 15, Title 23, Chapter 3, non-friable asbestos can be disposed of in a Class III landfill provided the facility has waste discharge requirements permitting the disposal of asbestos.

Since asbestos poses a potential risk to public health, it is not possible to recycle or divert it from landfill disposal; therefore, the only alternative to consider in managing asbestos is disposal in accordance with all pertinent local, state, and federal regulations.

**Used tires** pose special handling and disposal problems because of potential environmental and public health impacts. For example, stockpiled used tires can collect rainwater and serve as breeding grounds for disease vectors; they can also pose a fire hazard. Tires disposed of in a landfill tend to "float" to the surface, thereby interrupting landfill cover. They can cause differential landfill settlement if concentrated in one area in the landfill. Nevertheless, in compliance with current regulations, tires are considered non-putrescible waste and therefore can be accepted at Class III or unclassified landfills provided they are shredded or otherwise reduced in volume.

Generally, used tires are either disposed of, or are diverted to a tire recycler for one or several uses, including re-use, tire-derived products, or tire-derived fuel.

**"White goods"** are large appliances (such as washers, dryers, and refrigerators) that have entered the waste stream. White goods have special handling requirements because of their sheer size and weight; in addition, they may contain polychlorinated biphenyls (PCBs) and chlorofluorocarbons (CFCs). PCBs are a known human carcinogen, and CFCs have been shown to break down the stratospheric ozone layer.

The electrical capacitors and cooling units in these appliances must be removed before the white goods are placed in a landfill. White goods must be thoroughly crushed before burial to avoid refuse bridging, which can cause uneven compaction of the refuse fill. If the electrical capacitors and cooling units are not removed before crushing, PCBs and CFCs could be released into the environment.

Generally white goods are managed by a combination of source reduction (repair, reuse), recycling, and disposal.

**Abandoned vehicles** (under California regulations), are considered to be an unclassified waste, thus qualifying for disposal in a Class III landfill.

**Dead animal** collection and disposal are generally managed at a County level under the authority of the Animal Control Department of the Santa Clara County Public Services Agency. Owners are responsible for the disposal of their pets; however, the Department will collect and dispose of the animal for a fee. State agencies are responsible for dead animals found on highways or state property.

Many landfills are normally permitted to accept small animals for disposal; generally, large animals should be taken to a renderer.

## **Handling Methods for Disposal**

Special waste requires specific handling methods for disposal; these are enforced by the Regional Water Quality Control Board, the Local Enforcement Agency, and the California Integrated Waste Management Board. Summarized below are common handling requirements for the disposal of special wastes.

### **Sewage Sludge**

Water treatment sludge can be discharged at a Class III landfill under the following conditions, unless the DHS determines that the waste must be managed as a hazardous waste: (1) the landfill is equipped with a leachate collection and removal system; (2) the sludge contains at least 20 percent solids if primary sludge (or at least 15 percent solids if it is secondary sludge); and (3) a minimum solids-to-liquid ratio of 5:1 by weight is maintained.

### **Ash**

Ash may be landfilled at a Class III facility unless the DHS determines that the ash must be managed as a hazardous waste.

### **Asbestos**

Friable asbestos-containing waste must be managed as a hazardous waste. Nonfriable (non-hazardous) asbestos can be disposed of at a Class III landfill, provided that certain handling requirements are adhered to and the facility is properly permitted. Handling requirements include a dedicated disposal area away from the normal tipping area, and immediate entombment upon receipt of the waste.

### **Used Tires**

Effective January 1, 1993 whole waste tires will be prohibited from disposal in California by state law. Tires which have been shredded or otherwise permanently reduced in volume may be disposed at landfill facilities.

### **White Goods**

Recent State and Federal legislation will affect the way in which white goods will be managed in the future. The Clean Air Act, which went into effect July 1, 1992, bans the deliberate release of all chlorofluorocarbons (CFCs) into the atmosphere. This Act requires that all CFCs (usually freon) be removed from white goods before they are processed for recycling.

After January 1, 1994, State law (AB 1760) prohibits a solid waste facility from accepting for disposal any major appliance or other metallic discard which contains enough metal to be economically feasible to salvage. Since this law does not go into effect until January 1, 1994 jurisdictions could take action to ban disposal of white goods at an earlier date.

White goods that are accepted for disposal at a Class III landfill should be placed in the lower portion of the advancing lift, separated to prevent bridging of the surrounding refuse, and thoroughly crushed by compacting equipment. Electrical capacitors and cooling units must be removed from the units before placement of the white goods in the landfill.

### **Abandoned Vehicles**

No landfills in Santa Clara County are permitted to accept abandoned vehicles. Abandoned vehicles pose the same disposal problems as other large bulky items such as white goods and should be handled accordingly.

### **Dead Animals**

Generally, large dead animals should be taken to a renderer. Small dead animals can be disposed of at the active tipping area of the landfill. Large quantities of small dead animals should be disposed of at the base of the active face and covered immediately with soil.

## **Objectives**

The special waste objectives presented in this section have been developed to meet the goal of reducing the amount of special waste generated in the Town of Los Altos Hills. These objectives are to be implemented in the short-term planning period (1991-1995) and continued during the medium-term planning period (1996-2000). The Town of Los Altos Hills can expect to divert 0.1 percent (8 tons) of the total waste stream by implementing the following objectives:

- reduce the hazard potential of all special wastes generated in Los Altos Hills.
- continue existing programs that divert recyclable special waste from landfilling, particularly white goods.
- continue to provide for environmentally safe management or disposal of special waste that cannot be recycled. In the Town of Los Altos Hills, these wastes include white goods, tires, and small amounts of asbestos and dead animals.
- increase the recovery of recyclable special waste from the solid waste stream.

Target waste types for special waste have been identified, based on three factors: (1) the results of solid waste generation studies; (2) the effectiveness of meeting the special waste objectives; and (3) criteria that include the volume and weight

of the material, the hazard created by the material, the percent content of non-renewable resources, the durability of the material, and the recyclability of the material. These target waste types are:

- Sewage Sludge
- Ash
- Asbestos
- Abandoned Vehicles
- Tires
- Dead Animals
- White Goods
- Other Special Waste

Alternatives for diverting the targeted special waste types from landfilling (as well as alternatives for managing by collecting, treating, and disposing of the targeted special waste types listed) are evaluated below in the section entitled "Evaluation of Alternatives" according to their effectiveness in meeting the special waste objectives.

## Existing Conditions

**Program Description and Wastes Diverted:** This section describes existing special waste diversion and management activities and programs in the Town of Los Altos Hills. The jurisdiction has carefully reviewed and documented all potential and ongoing special waste efforts, including all the Town of Los Altos Hills programs. The quantities of special waste diverted by the Town's programs (by waste category and waste type), are presented in Table 5-1. The existing special waste diversion rate is estimated to be 0.1 percent (8 tons) of the current total waste stream.

**Table 5-1**  
**Existing Diversion Rates for Special Wastes in Los Altos Hills**

<u>Targeted Special Waste</u>	<u>Quantity Diverted (tons)</u>	<u>Percent of total waste-stream</u>
White goods	7.9	0.1
Dead Animals	0.1	0.001
Sub Total	8.0	0.1

**White Goods.** White goods collected from the Town of Los Altos Hills at quarterly clean-up days are recycled at Zanker Road Landfill for reclamation of freon and recycling of metal. White goods taken to scrap processing centers are utilized primarily for ferrous and non-ferrous metal content. Motors, insulation, upholstery, paint, plastics and other non-metallic substances, commonly referred to as "fluff", are removed. Remaining metals are shredded, separated, and sold to re-smelters. Motors are sometimes processed separately for copper content. Most insulation removed from appliances is classified as a hazardous material, so special handling and disposal is required.

**Dead Animals.** The primary management practice for small dead animals in the Town of Los Altos Hills is to contract for disposal with Koefran Services of Sacramento. Koefran provides a freezer at city animal shelters and the Humane Society of Santa Clara for storage of animal remains. Koefran collects the remains periodically and transports them to Sacramento, where the remains are recycled into bone meal and fertilizer by a rendering company. Large animals must be collected and processed by a rendering plant within 48 hours of death.

**Asbestos.** Friable asbestos is defined by the Bay Area Air Quality Management District regulations as "any material that contains more than one percent asbestos by weight and that can be crumbled, pulverized, or reduced to powder, when dry by hand pressure".

Because of the recognized health risk, manufacture and use of asbestos products have rapidly decreased in recent years. However, much of the material is still present in residential, commercial, and industrial buildings and must be removed, encapsulated, and properly disposed.

According to the California Department of Health Service's Hazardous Materials Report Manifest Information System, 2866.8 tons of friable asbestos-containing waste was generated in Santa Clara County during 1987. Of that amount 7.7 tons was handled by three local companies (Solvent Services, HazControl, and IBM) who shipped the waste to other disposal facilities out of the county. The remaining wastes were shipped directly to out-of-county facilities. None of the asbestos containing waste was disposed of in this county.

According to state regulations, asbestos may be disposed in Class III landfills provided wastes are properly contained and appropriate disposal precautions are taken at the landfill site. Within the San Jose area, two landfills will accept non-friable asbestos-containing wastes for disposal: the Guadalupe Landfill and the Zanker Road Landfill.

**Abandoned Vehicles.** Scrap automobiles are generally handled by firms specializing in auto dismantling, where usable parts are salvaged, scrap metal is recycled, and other components are disposed as appropriate for the waste type.

**Used Tires.** Oxford Tire Recycling of Northern California collects tires from landfills, service stations, and tire dealers and transports the tires to its facility in Union City, California, where the tires are separated for delivery to an appropriate end use. Tires in resalable conditions and casings that can be used for retreaded tires are taken to tire distributors. The tires can also be used to obtain tire-derived products such as playground covering, floor mats, dock bumpers, floor tiles, asphalt rubber, and rubber modified asphalt. Tires are also taken to a shredding facility in Sacramento, California. Shredded tires can be used as playground cover material or as tire-derived fuel

Tires that are not reused, or used for tire-derived products or shredded fuel, are taken to the Tire-to-Energy Plant in Westley, California. This facility, operated by the Oxford Energy Company, incinerates whole tiers to produce steam to generate electricity. The plant recovers incineration by-products including fly ash and gypsum. Fly ash containing zinc is shipped to a smelting facility. Gypsum has nonagricultural land applications. Slag from the steel and fiberglass belts in the tires is recovered and used for road base (i.e., under asphalt).

**Sewage Sludge.** Sewage from the Town of Los Altos Hills is treated at the Palo Alto Regional Water Pollution Control Plant (PARWPCP) in Palo Alto. The PARWPCP operates under permits from the Bay Area Air Quality Management District, and the Regional Water Quality Control Board. The sludge generated at the PARWPCP is incinerated at an on-site incinerator. The ash that is produced as a result of the incineration is sent to a copper smelter in Arizona. The ash is used as flux at the smelter.

Since the plant is not permitted by the CIWMB, sewage sludge is not included in the determination of total disposed

**Other Special Waste.** This category has been used for a group of wastes which are potential special waste. These wastes include: mattresses and furniture. Mattresses and box springs and large furniture are disposed of at Zanker Landfill and Newby Island Landfill.

**Future Status of Programs:** The Town of Los Altos Hills expects to continue all ongoing special waste activities in the future.

## **Discussion and Evaluation of Alternatives**

Management practices should take advantage of all viable markets and end uses for recyclable special wastes. In the Town of Los Altos Hills, the recyclable special wastes include white goods, dead animals, and tires. With the exception of the first alternative, the waste management methods evaluated in this section address the objective of increasing the recovery of recyclable special waste from the waste stream.

### **Alternative 1 - Disposal of Special Wastes**

Special waste generated by the Town of Los Altos Hills can be disposed of at the Newby Island landfill in accordance with the facility's Waste Discharge Requirements (WDR), issued by the Regional Water Quality Control Board. The alternative of disposing of special waste in an environmentally safe manner in accordance with pertinent regulations is evaluated below to determine whether this alternative is appropriate for the Town of Los Altos Hills, as well as to compare it to other alternatives.

**Effectiveness:** This alternative does not reduce quantities of special wastes currently disposed of.

**Hazard:** Workers responsible for the disposal of special waste are subjected to both health and safety risks from the handling of potentially hazardous materials and bulky items. To reduce the hazard potential, workers should be properly equipped and trained in handling hazardous wastes. In addition, workers should receive basic safety training.

**Flexibility:** With relatively minor changes in the management of special wastes (excepting sewage sludge), disposal of special wastes can be adjusted to conform with changing conditions.

**Consequences to the Waste Stream:** This alternative would not affect the waste stream.

**Implementation Period:** No "start-up" period would be required.

**Facility Requirements:** This alternative would not require any new or expanded facilities.

**Consistency with Local Conditions.** Disposal of special waste is consistent with local plans and policies. However, in accordance with the solid waste processing hierarchy established in AB 939, disposal should be the final step in the treatment of special waste, and should occur after source reduction and recycling efforts have been made.

**Institutional Barriers:** There are no significant institutional barriers to this alternative.

**Estimated Cost:** No significant costs are associated with this alternative. Disposal of special waste is estimated to cost the Town of Los Altos Hills approximately \$10,000 per year.

**End Uses:** Not applicable.

## **Alternative 2 - Sewage Sludge Composting**

Composting is the controlled biological decomposition of solid organic materials. The end product of composting is a stable humus or soil-like material that can be used as a soil conditioner, mulch or fertilizer, depending on its physical properties. Sewage sludge generated in the Town of Los Altos Hills can be composted and sold to the general public for such uses. The benefit of composted sludge, as compared to non-composted sludge, is that most odors are eliminated during the composting process, making a more appropriate product for general public use.

**Effectiveness:** This alternative would be effective in diverting sewage sludge from disposal.

**Hazard:** Assuming that the composted sludge is not applied to land used for agricultural crops, this alternative does not have any known hazards.

**Ability to Accommodate Change:** The ability of this alternative to accommodate change is limited to the amount of composted sludge that can be stockpiled during unfavorable market conditions.

**Consequences to the Waste Stream:** This alternative will not shift the waste stream toward non-recyclable or unmarketable materials.

**Implementation Period:** Implementation of this alternative cannot be accomplished in the short-term in Los Altos Hills, but could be completed by 2000.

**Facility Requirements:** Los Altos Hills does not currently have the facilities to compost its sewage sludge. Since no sewage is processed in the Town limits, Los Altos Hills would have to re-route sewage back to the Town. These costs would be very high. Therefore, it is unlikely that Los Altos Hills will be able to independently compost its sewage sludge. However, coordinated efforts with Palo Alto and Los Altos may help these municipalities implement sewage composting programs.

**Consistency with Local Plans and Policies:** This alternative is consistent with local plans and policies.

**Institutional Barriers:** There are no institutional barriers to this alternative.

**Estimated Cost:** This alternative normally requires minimal implementation and operating costs. Annual operating expenses are expected to range between \$50,000 and \$100,000 for a composting facility. While it is unlikely that Los Altos Hills could support such a facility on its own, it is possible that inter-jurisdictional cost sharing will make this option more attractive.

**End Uses:** Composted sewage sludge can be sold to the general public as soil conditioner, mulch, or fertilizer. A relatively stable market is anticipated to be available for this product.

### **Alternative 3 - Land Application of Sewage Sludge**

Sewage sludge generated in the Town of Los Altos Hills can be used beneficially as soil amendment or fertilizer for agricultural purposes. Benefits accruing from the use of sludge for these purposes include reduced need for inorganic fertilizers, improved soil fertility and tilth, decreased consumption of energy, and reduced hazardous air emissions.

**Effectiveness:** This alternative would be effective in diverting sewage sludge from the waste stream.

**Hazard:** Uptake of heavy metals (Cd, Pb, etc.) in food crops could pose a potential health hazard. The characteristics of the sludge will determine its suitability for application at a particular site.

**Ability to Accommodate Change:** This alternative can be limited by changing conditions, particularly social acceptance of the use of sewage sludge for application to land.

**Consequences to the Waste Stream:** This alternative would not affect the composition or quantity of wastes generated in Los Altos Hills.

**Implementation Period:** This alternative can be implemented during the short-term planning period.

**Facility Requirements:** A facility would be required where the sludge could be stabilized in order to be transported.

**Consistency with Local Plans and Policies:** This alternative is consistent with local plans and policies.

**Institutional Barriers:** This alternative would require the acceptance of local farmers and farm bureaus.

**Estimated Cost:** Costs are anticipated to be minimal, with the cost of transporting the sewage sludge to the site of application being the most significant.

**End Uses:** When applied to land, sewage sludge functions as a soil amendment or fertilizer. The southern portion of Santa Clara County is a potentially significant market due to the extensive agriculture in the area.

#### **Alternative 4 - Divert Tires from Landfilling for Ultimate End Use**

Used tires generated in the Town of Los Altos Hills can be reused or recycled as a variety of end products, including floor tiles, dock bumpers, and playground covering. An important component of this alternative is the availability of a facility to stockpile used tires. The Town of Los Altos Hills could develop a contractual arrangement with a firm such as Oxford Tire Recycling of Northern California to collect used tires generated by the Town. The collected tires would ultimately be recycled as specific end products or would be used as tire-derived fuel for the generation of electricity.

**Effectiveness:** This alternative could be effective in reducing the quantity of used tires in the waste stream.

**Hazard:** Prior to being processed, waste tires are stockpiled. When exposed to the elements, stored tires collect rainwater and serve as breeding grounds for disease vectors; they can also be a fire hazard. To minimize the hazard potential, the storage times should be limited. Additionally, the stockpiled tires can be protected from the elements by a tarp.

**Ability to Accommodate Change:** Provided that waste tires can be sent to a regional facility for storage during unfavorable market conditions, this alternative can accommodate changing conditions. However if a regional waste tire facility (such as that operated by Oxford Tire Recycling) were not available, this alternative would be limited in its flexibility.

**Consequences to the Waste Stream:** Implementation of this alternative would have a positive effect on the waste stream by diverting a problem waste from landfilling.

**Implementation Period:** Implementation would be dependent on the establishment of a regional facility permitted to accept only shredded tires. It is anticipated that this could occur within the short-term planning period provided that there is strong support on the regional level.

**Facility Requirements:** A facility for the stockpiling of tires would need to be established. The waste tire facility would be developed and permitted in accordance with the requirements of Assembly Bill 1843, codified in Public

Resources Code Section 42800, et seq. This facility would stockpile used tires for future processing, including shredding and transport to a regional facility permitted to accept shredded tires. The purpose of the proposed waste tire facility would be to receive the tires that are currently being disposed of by the jurisdiction.

**Consistency with Local Plans and Policies:** The diversion of tires for ultimate end use is consistent with plans and policies and ordinances of the Town of Los Altos Hills.

**Institutional Barriers:** Existing waste hauling and disposal contracts may be affected if used tires are diverted to a waste tire facility for ultimate recycling. There could be resistance from these companies in diverting this waste from the universe of disposed wastes because of the potential for reduced revenues.

**Estimated Cost:** Not available at this time.

**End Uses:** Used tires in good condition can be resold, and casings usable for re-treaded tires can be marketed to tire distributors. Used tires can also provide the raw material for tire-derived products such as playground covering, floor mats, dock bumpers, floor tiles, asphalt rubber and rubber-modified asphalt. Additionally, tires can be shredded at a shredding facility and ultimately used as playground cover material, or as tire-derived fuel.

Tires that are not reused or are used for tire-derived products or fuel can be taken to a Tire-to-Energy Plant. Here whole tires are incinerated to produce steam to generate electricity. Tire-to-Energy Plants can recover incineration byproducts that include fly ash and gypsum. The fly ash (which contains zinc) can be shipped to a smelting facility; gypsum can be used for nonagricultural land applications. Slag from the steel and fiberglass belts in the tires can be recovered and used for road base (i.e., under asphalt). There is currently a fairly stable market for used tires in northern California.

### **Alternative 5 - Prohibit Disposal of Used Tires at Landfills**

Used tires could be accepted at the Newby Island landfill but would be banned from disposal. Landfills would require waste haulers to identify used tires in the incoming loads and to deposit them at a specified stockpile location at the landfill site. Stockpiled tires could then be recovered by a tire recycler, such as Oxford Tire Recycling of Northern California.

**Effectiveness:** On a regional basis, this alternative would be effective in diverting tires from disposal, provided that transport, processing, and ultimate recycling can be arranged.

**Hazard:** Stockpiled used tires can collect rainwater and serve as breeding grounds for disease vectors, and can also be a fire hazard. These hazards are difficult to control; limiting the storage time and protecting the tires from exposure to the elements by covering with a tarp are recommended control mechanisms.

**Ability to Accommodate Change:** The ability of this alternative to accommodate change is limited to the quantity of tires that can be stockpiled on site during unfavorable market conditions.

**Consequences to the Waste Stream:** This alternative would divert tires from the waste stream, but would not affect the composition of wastes generated in Los Altos Hills.

**Implementation Period:** A landfill ban on tires could be implemented in the short-term planning period.

**Facility Requirements:** No facilities are necessary for this alternative. However, space would need to be made available at the Newby Island landfill.

**Consistency with Local Plans and Policies:** This alternative is consistent with local conditions for stockpiling of tires.

**Institutional Barriers:** Waste hauling and landfill operating contracts may provide a barrier to this alternative because of the potential for reduced disposal revenues.

**Estimated Cost:** There are no significant costs associated with this alternative.

**End Uses:** See the discussion of end uses for used tires provided with Alternative 4. There is currently a fairly stable market for used tires in northern California.

## **Alternative 6 - Prohibit Disposal of White Goods at Landfills**

White goods could continue to be accepted at the Zanker Road and Newby Island landfills, but would be banned from disposal. These landfills would require waste haulers to identify white goods in the incoming loads and to deposit them at a specified stockpile location at the landfill site.

**Effectiveness:** This alternative would be effective in diverting white goods from disposal.

**Hazard:** Stockpiled white goods may pose health risks to workers as a result of exposure to PCBs. To reduce the potential for hazard, workers should be properly trained in handling PCBs and provided with appropriate safety gear and equipment. Another potential hazard is the release of CFCs into the atmosphere.

**Ability to Accommodate Change:** The ability of this alternative to accommodate change is limited to the quantity of white goods that can be stockpiled on site during unfavorable market conditions.

**Consequences to the Waste Stream:** This alternative would divert white goods from the characterized waste stream. White goods account for less than one percent (7.9 tons) of the waste stream.

**Implementation Period:** A landfill ban on white goods could be implemented in the short-term planning period.

**Facility Requirements:** This alternative requires an area at the landfill for stockpiling white goods, but does not require any new facilities. Existing landfill staffing is considered sufficient to implement this alternative.

**Consistency with Local Plans and Policies.** This alternative is consistent with local plans and policies.

**Institutional Barriers:** Existing waste hauling and landfill operating contracts may provide a barrier to this alternative unless modifications can be readily implemented.

**Estimated Cost:** There are no significant costs associated with this alternative. White goods can be stockpiled by existing landfill personnel.

**End Uses:** White goods can be repaired and reused; they can also be used for scrap metal following the removal of electrical capacitors and cooling units. The metal components of the white goods are processed for reuse in mills and foundries to produce new steel.

## **Alternative 7 - White Goods Processing Operation**

White goods can be diverted from the waste stream at transfer stations and/or landfills by facility personnel. As incoming loads are discharged, the spotter and the equipment operator will separate identified white goods from the discharged load. The white goods will then be moved to an area clear of operations in the transfer station or to an area removed from the active face at the landfill. At the end of each day, the collected white goods will be moved to a designated white goods stockpile area. At the stockpiled area, electrical capacitors, cooling units, insulation, and wiring will be removed. The electrical capacitors and cooling units will be recycled and the insulation and wiring landfilled. The scrap metal will be sold to a scrap metal dealer.

**Effectiveness:** This alternative would be effective in diverting white goods from disposal.

**Hazard:** Potential hazards include risk of injury to landfill personnel from removing the white goods or from working around heavy equipment, and exposure to PCBs. To reduce the potential for hazard, workers should be properly equipped and trained in handling PCBs. Another potential hazard is the release of CFCs into the atmosphere.

**Ability to Accommodate Change:** This alternative is limited by the quantity of white goods that can be stockpiled on site during unfavorable market conditions.

**Consequences to the Waste Stream:** This alternative would divert white goods from the waste stream; white goods account for approximately 0.1 percent (7.9 tons) of the Town's waste stream.

**Implementation Period:** Immediate implementation appears feasible using equipment and personnel that are currently available at existing landfills.

**Facility Requirements:** This alternative requires an area at participating landfills for stockpiling white goods, but does not require any new facilities.

**Consistency with Local Plans and Policies:** This alternative is consistent with local plans and policies.

**Institutional Barriers:** Changes to the union contract and landfill personnel job descriptions may be necessary. Some unions (and personnel) may be reluctant to handle the hazardous components of white goods (capacitors and cooling units).

**Estimated Cost:** There are no significant costs associated with this alternative; however, additional labor would be required to dismantle the white goods. An additional staff person on a part-time basis is expected to be sufficient. Costs are not expected to exceed \$15,000 per year.

**End Uses:** The electrical capacitors and cooling units that have been removed from the white goods can be recycled. The remaining scrap metal can be processed for reuse in mills and foundries to produce new steel. The market for scrap metal is relatively stable.

## **Selection of Program**

In the previous section, seven alternatives were presented for consideration; each was evaluated according to a range of criteria mandated by the regulations governing AB 939. Each alternative has inherent qualities that makes it either more or less attractive to the Town of Los Altos Hills. In addition, each alternative has aspects that may be more or less appropriate to the Town of Los Altos Hills' goals, objectives, policy environment, waste stream, and solid waste management system.

In this section, the Town of Los Altos Hills presents the results of the evaluation of the alternatives presented in the previous section. To accomplish this, the Town of Los Altos Hills has assessed whether or not each alternative is appropriate to the Town's needs and assigned each alternative a ranking in order to select various alternatives. In selecting among alternatives and programs, the Town of Los Altos Hills considered the following critical factors: (1) the degree to which each alternative and program is appropriate to the conditions of the jurisdiction (i.e., goals, objectives, policy environment, waste stream, solid waste management system and the size of the Town), and (2) the degree to which the alternatives and programs complement each other and form a coherent, comprehensive, and cost-effective package. Alternatives were assigned ratings of high, medium, and low according to the assessment of their evaluation criteria. The results of these ratings are presented in Table 5-2 (See Appendix C).

Based on the results of this evaluation and assessment, the alternatives selected to meet the goals and objectives of this component in the short-term and medium-term planning periods are presented below.

## **Short-Term Planning Period**

In order to meet the goals and objectives outlined in this component, the Town of Los Altos Hills will divert approximately 0.1 percent (8 tons) of the total waste stream in the short-term planning period. This selection is based on impact, effectiveness and ease of implementation in the short-term. Waste types that will comprise this diversion rate will include, but not be limited to, white goods, dead animals and tires. The Town of Los Altos Hills has selected the following alternatives:

- Continue to review disposal of special waste.
- Continue a program to prohibit disposal of used tires at landfills.
- Continue a program to prohibit disposal of white goods at landfills.
- Continue dead animal collection and rendering.
- Support regional efforts to recycle or reprocess tires.
- Support regional efforts to reapply sewage sludge to the land, or to compost sewage sludge for agricultural reuse.
- Safely dispose of any non-recyclable or non-recoverable special waste.

## **Medium-Term Planning Period**

In order to meet the goals and objectives outlined in this component, the Town of Los Altos Hills will continue to divert approximately 0.1 percent (8 tons) of the total waste stream in the medium-term planning period. All programs and alternatives selected in the short-term planning period will be continued in the medium-term. As conditions change, and new techniques for recovery are discovered, the Town of Los Altos Hills will re-evaluate and change its programs if necessary.

No new facilities are required within Los Altos Hills to implement the selected alternatives in the short-term and medium-term planning periods. However, regional and inter-jurisdictional efforts may require the expansion and or development of additional operations facilities.

## **Multi-Jurisdictional Special Waste Efforts**

Multi-jurisdictional special waste efforts may be needed to implement some of the programs. For example, dead animals are currently handled at the County level. Other potential multi-jurisdictional efforts include (1) multi-jurisdictional waste tire facilities, (2) establishment of a county landfill permitted to accept only shredded tires, and (3) coordination of marketing of composted sludge.

## Program Implementation

This section identifies and describes the specific government agencies responsible for implementing the selected alternatives and programs, the specific tasks necessary to achieve full implementation of the selected alternatives and programs, and an implementation schedule. This information is presented in Table 5-3 located at the end of this component. Additionally, the costs, revenues, and revenue sources necessary for implementation of the selected programs are presented in Table 5-4 at the end of this component.

## Monitoring and Evaluation

To ensure that the selected special waste alternatives and programs are meeting the goals and objectives of this component, the Town will implement a monitoring and evaluation program. Where appropriate, LAGCo will assist the Town with monitoring and evaluation. Because the objectives of this component extend throughout both the short-term and medium-term planning periods, the Town's monitoring and evaluation program will continue, as needed, during both planning periods.

**Monitoring Methods:** This section presents the methods for quantifying and monitoring the achievement of the following objectives for the special waste component.

**Objective 1:** Reduce the hazard potential of special waste generated in the Town of Los Altos Hills special waste.

**Objective 2:** Continue existing white goods and dead animal programs that divert recyclable special waste from landfilling.

**Objective 3:** Continue to provide for environmentally safe management or disposal of special waste that cannot be recycled.

**Objective 4:** Increase the recovery of recyclable special waste from the solid waste stream.

**Monitoring Method:** Periodic inspections of handling methods for special waste will be conducted at landfills used by Los Altos Hills. These will focus on (1) determining whether waste handling methods required by the regulatory agencies are being implemented, (2) checking to ensure that facility staff is properly outfitted and equipped to handle specific "problem" wastes, and (3) verifying that staff is properly trained in safety and hazardous waste handling methods. In addition, further waste characterization studies will be planned for the end of the short-term planning period to measure changes in both waste types and waste quantities. These studies will be combined with more informal "spot check" assessments of waste composition to monitor the increased diversion of special waste from landfilling. Specific emphasis will be given to quantifying the reduction in landfilling of special wastes that pose health and safety hazards.

**Written Criteria:** The Town will prepare annual reports summarizing the findings of the monitoring activities described above. The report will provide written criteria evaluating the effectiveness of the special waste alternatives by

reporting on whether (1) the special waste objectives are being achieved; (2) the selected programs and activities were implemented on schedule; (3) waste handling practices have changed.

**Responsibility For Monitoring:** The monitoring and evaluation activities described in this section will be implemented by the Los Altos Hills Department of Public Works and assisted by LAGCo where appropriate.

**Funding Requirements:** Funding for the monitoring and evaluation program described in this section will be provided by the Town through the Solid Waste Fund, which in turn comes from franchise and disposal fees. Funding for this program includes the costs of (1) administrative activities, (2) record-keeping, (3) program monitoring and surveying, and (4) annual report-writing. The annual cost to the Town throughout the short-term planning period is estimated to be between \$2,500 - \$17,500.

**Contingency Measures:** If the programs described above fail to meet the goals and objectives of this component, the following tasks can be implemented:

- Introduce additional waste acceptance procedures at the landfill in order to divert special wastes from disposal.
- Increase staffing at the landfill for salvaging materials at the active dumping area of the landfill.
- Locate new/additional markets for recovered recyclable special wastes.
- Amend special waste disposal practices.
- Analyze existing programs and alternatives for obstacles to successful implementation.
- Modify selected alternatives, including degree, scope, or extent of special waste activity and implementation schedule.
- Seek additional funding.
- Select additional alternatives.
- Consider regulatory programs or mandatory programs.

**Table 5-3  
Implementation Plan Special Waste Component**

Town = Town of Los Altos Hills  
LAGCo = Los Altos Garbage Company  
County = County of Santa Clara

<u>Task</u>	<u>Responsible Agency</u>	<u>Implementation Date</u>
Continue to review disposal of special waste	Town/LAGCo	ongoing
Continue pick-up days for and subsequent recycling of white goods	Town/LAGCo	ongoing
Continue program for dead animal collection and rendering	Town/County	ongoing
Continue program to prohibit disposal of tires in the landfill	Town/LAGCo	ongoing
Examine and if feasible support regional tire recycling efforts	County/Town	ongoing
Examine, and if feasible support inter-jurisdictional sewage sludge reuse, or composting programs	County/Town	ongoing
Dispose of non-recyclable special waste safely	County/Town/LAGCo	ongoing

All solid waste programs in the Town of Los Altos Hills will be coordinated and administered by the Department of Public Works.

**Table 5-4  
Short- and Medium-Term Program Costs and Funding Sources**

Program	Annual Cost to the Town of Los Altos Hills	Funding Source
White good collection and recycling	\$10,000	Solid Waste Fund (2)
Dead animal collection and rendering	\$2,500	General Fund (3)
Regional tire recycling efforts	\$0-5,000 (1)	Solid Waste Fund
Inter jurisdictional sewage reuse	\$0-5,000 (1)	Solid Waste Fund
Disposal of non-recyclable special wastes	\$5,000	Solid Waste Fund

- 1, Costs are estimates, and cover a range of possible program expenditures
- 2, Supported by franchise and disposal fees
- 3, Includes monies allocated for animal control

**FOOTNOTES \*\*\*\*\***

<sup>1</sup>A Class III landfill accepts only non hazardous solid waste.

# EDUCATION AND PUBLIC INFORMATION COMPONENT

## Introduction

Education and public information is one of the most important components of AB 939. The public needs to be made aware of the importance of managing solid waste. An education and information program must be based on the requirements of the other components. Integrating the components is critical because the overall approach to solid waste management must be balanced in order to meet the needs of the jurisdiction and the requirements of the state.

This component documents current education and public information activities for Los Altos Hills and describes how participation in reduction, recycling, and composting activities will be stimulated through implementing new education and public information programs and expanding existing ones.

## Goals and Objectives

Establishing clear goals and objectives for educational efforts provides an understanding of the program to governmental agencies, residents, and the business community. In addition, monitoring, evaluation, and improvement of public education becomes easier when the goals and objectives are specified.

General goals identified by Los Altos Hills include:

- Support existing and planned source reduction, recycling and composting programs and services through education and public information activities;
- Increase participation in existing and planned source reduction, recycling, composting and public information efforts;
- Increase public awareness of environmental and solid waste issues;
- Create broad visibility for recycling;
- Stress the importance to all sectors of buying recycled and composted material

The following sections describe short-term and medium-term objectives for Los Altos Hills' Education and Public Information Component.

## **Short-Term Objectives**

- Expand existing public education and information programs that address source reduction, composting, recycling and household hazardous waste;
- Provide information to at least 90% of the residents regarding Los Altos Hills' waste reduction and recycling programs by 1995;
- Create public involvement opportunities through recycling promotions and events;
- Provide residents with information for participation in local collection programs;
- Educate the public about the uses of recycled and composted materials, emphasizing "closing the loop" through a "buy recycled" campaign;
- Participate in county-wide public education efforts;

## **Medium-Term Objectives**

Medium-term objectives will build upon short-term objectives and will focus upon the following:

- Expand existing programs;
- Revise and improve current efforts based on feedback obtained from the evaluation of short-term activities;
- Develop new programs to target specific sub-populations or waste streams.

## **Existing Conditions**

This section discusses current education and public information programs in Los Altos Hills. Los Altos Hills is a predominantly residential community. Several schools are located in the Los Altos Hills area, including Foothill College. Due to Los Altos Hills' unique residential and institutional character, only residential and institutional educational programs exist in the community, and only these programs are discussed below.

## **Residential Education**

A primary medium for educating residents of Los Altos Hills is through mailings. Currently, information about recycling programs is sent with billing statements by the Los Altos Garbage Company. The garbage company runs the Town's curbside recycling and yard waste drop-off program, and in its mailings informs residents of new or important developments.

Residents are also educated through the Town of Los Altos Hills *NEWSLETTER*, a semi-annual publication put together by Town Hall volunteers. This letter has been a good medium for relaying information to the public in the past, and as the recycling program has been implemented, the *NEWSLETTER* has been used for educating residents about changes and options regarding recycling.

Town Hall also keeps materials on recycling available for any interested residents. Materials include composting manuals, recycling information, garbage reduction guides, and general solid waste management literature.

## **Institutional Education**

There are several educational institutions in Los Altos Hills. Foothill College runs its own recycling and yard waste re-use program. Current recycling programs at the college are student run, and student organizers provide education to other students and staff. Fliers and posters, as well as group discussions are all educational methods used at Foothill.

Other schools in the Los Altos Hills area also recycle, and these schools employ classroom education and poster/flier announcements as means for fostering student awareness.

Town Hall is the only other institution in Los Altos Hills, and all staff are periodically informed of better ways to reduce waste. Staff also process, handle, and absorb the same materials presented to residents, as well as a good deal of materials kept on reserve at the Town Hall site.

## **Program Alternatives**

To heighten the effectiveness of the various programs, and ensure an efficient use of resources, education and public information resources should be targeted to specific audiences whenever possible. While Los Altos Hills is a predominantly residential community, sub-groups within the Town limits may be more influenced by certain educational and informational campaigns than others, and for this reason targeted educational programs may be beneficial. At the same time, some general information regarding waste management should be disseminated to all residents of the Los Altos Hills area.

## **General Approaches to Education and Public Information**

The following are all possible approaches for educating residents of Los Altos Hills about various solid waste facts, programs, and options.

- Create a small community advisory committee to assist in developing and implementing educational programs.
- Provide mass mailings (community newsletters), either alone or with utility bills.
- Adopt a recognizable theme, logo, and message. The logo should appear on all printed and outdoor advertisements.
- Use a celebrity spokesperson or mascot as part of these efforts.
- Encourage press coverage of promotions, program introductions, effectiveness updates, and other notable events.
- Provide newspaper articles and inserts with local and regional newspapers.
- Encourage or run seminars, workshops, and related programs.
- Encourage participation in special events [e.g., Earth Day (especially if follow-up activities are planned), Recycling Week, County Fair, and local events such as employee picnics, holiday parades and celebrations].
- Make slide shows, videos, and speakers' bureaus available to community groups.
- Provide recycling curriculum and other information to public and private schools.
- Work cooperatively with community service organizations [e.g., Elks, Lions, Boy Scouts].
- Sponsor Town meetings, community forums, and public hearings to present and discuss reduction, reuse, recycling, and composting ideas.
- Appoint citizen advisory boards or task forces to monitor events and report to the public.
- Develop a network of motivated and committed volunteers to help "spread the word." This method has been proven particularly successful in disseminating composting information through gardening clubs and community gardens in what are often called "Master Composter" programs.
- Exhibit source reduction, recycling, and composting programs at public sites.
- Conduct tours, open houses, and publicity events at recycling centers and waste processing facilities to give the public a better understanding of the issues.

## **Options Pertinent to Institutional Sector**

Los Altos Hills will need to work in cooperation with local school districts to develop innovative approaches to educating the youth of the community. The following approaches can be utilized specifically for schools:

- Sponsor special events in schools;
- Initiate student-run recycling programs at each school;
- Where feasible, establish student-run pilot composting program;
- Expand environmental and waste management awareness in schools by integrating relevant topics into school curricula.

Los Altos Hills will also need to work in cooperation with Santa Clara County to develop appropriate programs, such as county wide education and information activities informing residents of county run programs like hazardous waste collection.

## **Specific Approaches Based on Programs**

A well-integrated education and public information program is necessary. The initial educational campaign must be followed up by additional information about specific components. The following areas have been identified as needing specific information and educational programs: recycling, composting, household hazardous waste, special waste, and source reduction.

### **Source Reduction**

For source reduction information, the objective will be to inform the public that alternatives to many products and uses are available and that these alternatives will reduce the amount of material requiring disposal at landfills.

To a great extent, source reduction can be accomplished only through legislative means. Mandates requiring manufacturers to reduce the amount of packaging or to change the type of packaging used must be left up to state and federal governments. One problem that will be difficult to overcome is concern about product safety and integrity. Over the years, there has been product tampering (most noteworthy in the pharmaceutical industry). This has caused manufacturers to adopt tamperproof packaging which, in some cases, has actually increased the amount of packaging.

A number of educational alternatives are available that will address residential and institutional education in Los Altos Hills. The use of brochures, the media, and public meetings are several avenues that can be used to inform the public about available services. Possible approaches are:

## **Residential Approaches**

- Educate residents about the benefits of buying and using cloth shopping bags instead of plastic or paper;
- Explain to residents how they can launch a letter-writing campaign requesting manufacturers and businesses (e.g., fast food outlets) to reduce the amount of packaging materials and/or switch to materials that are more sensitive to the environment;
- Distribute to residents the necessary information so they can write to their elected representatives at both the state and federal levels, requesting that action be taken to reduce the amount and type of packaging materials being used;
- Encourage the use of on-site composting and grass clipping programs through demonstration programs at neighborhood parks, use of Master Gardeners, and/or initiating a Master Composter program, and develop accompanying information to explain the benefits of programs;
- Encourage the use of cloth diapers, in cooperation with a local medical association and diaper services;
- Provide a directory of reuse and repair businesses;
- Provide information on how to remove names from junk mail lists;
- Distribute "Take Me Shopping" brochures for identifying environmentally safe and recyclable alternatives.

## **Institutional Approaches**

- Promote source reduction through mailings to schools and presentations to students;
- Develop materials and provide technical assistance to allow "do-it-yourself" waste audits;
- Develop materials and provide technical assistance to encourage the use of on-site composting and grass clipping programs.

## **Recycling**

For recycling information, the objective will be to enhance the current recycling education and information programs. The following are recommended approaches:

### **Residential Approaches**

- Enhance the residential canside/curbside education program.

- Develop information that explains the various enforcement procedures that Los Altos Hills has initiated. Examples include ordinances that prohibit the removal of recyclable materials from curbside bins by other than a licensed hauler, or destruction of recycling equipment;
- Provide feedback to the public on the success of the recycling programs (i.e., amount of materials recycled/resources saved, and the economics of the programs). Provide feedback through ads in local newspapers and publishing of annual reports.

### **Institutional Approaches**

- In cooperation with local school districts, develop educational programs for grades K-12. Specific programs for the different age groups and/or grade levels would be appropriate. Part of the program would be an actual on-site recycling program. These programs will also be available for use at private schools.

### **Composting**

A limited portion of the population understands what compost is or the benefits of using it. The information and education program will consider these approaches:

#### **Residential Approaches**

- Expand educational materials that address the residential yard waste drop-off program for leaves, grass clippings, and other vegetative material, with corresponding information on handling;
- Inform the public on how they can obtain compost and mulch from the program;
- Work with local garden clubs and Master Gardeners to help promote and educate the public;
- Work with the University of California cooperative extension to develop educational materials;
- Provide feedback to the public on the amount of yard waste collected and composted and how this material is used (through publishing of annual reports and articles in local newspapers);
- Educate the public on the benefits of using compost and mulch for home purposes.

### **Institutional Approaches**

- Develop information and education materials to support institutional yard waste collection and re-use programs.

### **Special Wastes**

Some special wastes, like infectious wastes, sludge, and ash, are quite specific and would not necessarily require that an educational program be developed. Other special wastes will require that educational materials be developed and expanded. Examples of programs to consider are:

### **Residential Approaches**

- Develop materials that inform the public how to properly dispose of such things as tires, white goods, auto bodies, and certain wood wastes. One approach is to publish a brochure on special wastes and mail it to all residents;
- Develop information to explain special clean-up day events. Information must be sent out prior to the actual day of pick-up. The information will include what can be disposed of, the date, and time of day;
- Develop information about the proper procedures to remove and dispose of asbestos. List local firms that are licensed to remove asbestos.

### **Institutional Approaches**

- Develop materials that inform how to properly dispose of such things as tires, white goods, auto bodies, and certain wood wastes. One approach is to publish a brochure on special wastes and mail it to all schools in the Los Altos Hills area;
- Develop information for commercial and self-haul generators that will explain about disposing of construction and demolition debris.

### **Household Hazardous Waste**

The Household Hazardous Waste Element addresses education and information. Most of the same avenues available for dissemination of information in the other components can be utilized to educate the public about the handling and disposal of household hazardous waste. Refer to the Element for a detailed discussion on education and information.

## **Program Selection**

Given these various options and considerations, Los Altos Hills will pursue education and public information through the following approaches. General as well as component specific educational approaches are defined.

### **Short-Term**

#### **General Education Approaches**

- Expand programs that address solid waste management in general. Approach should be directed to residential generators;
- Provide feedback to the public on the success of all implemented programs. Methods include publishing an annual report and newspaper articles;
- Develop educational materials for school age children and make available to private schools as well. Topics to be covered are recycling, composting, source reduction, and household hazardous waste;
- Develop information for commercial and self-haul generators to explain various options for the disposal of construction and demolition debris;
- Expand information to accompany special residential clean-up day events.

#### **Source Reduction Education Approaches**

- Develop and expand information on backyard composting programs. Improve availability of composting kits, "how-to" literature, materials describing the uses for compost, and establishment of a Master Composter program;
- Publish a directory of all reuse and repair businesses.

#### **Recycling Education Approaches**

- Enhance education materials for residential curbside recycling program;
- Provide a directory that lists brokers and end users of recyclable materials;
- Develop information that explains various enforcement measures that have been taken to protect recycling equipment and the illegal removal of recyclable materials from canside/curbside collection programs.

### **Special Waste Education Approaches**

- Develop education materials that describe how to properly dispose of special wastes.

### **Household Hazardous Waste Education Approaches**

- Develop materials to support the Household Hazardous Waste program.

### **Medium-Term**

To a great extent, the various programs outlined under short-term are ongoing in nature. Once developed and initiated, they will need to be updated on an annual basis. Specific programs for the medium-term are:

#### **General Approaches**

- Develop information about the materials recovery facility, its functions, and services provided;
- Develop materials to support the various self-haul programs.

#### **Household Hazardous Waste**

- Develop education materials to explain any permanent household hazardous waste facilities, their functions, and how to use the various services;

### **Cost of Program**

The cost to develop, implement, maintain, monitor, and evaluate the various tasks outlined in this component are largely dependent on the information mediums used, and upon program performance. Costs (for staffing and program materials) are expected to be approximately \$4,000 annually. Approximately 50 to 100 hours per year of staff time is estimated to be needed to implement the education and public information program.

Whenever possible, volunteers will be encouraged to assist in the education and public information outreach programs, with Town guidance. Funding will be provided by disposal charges and franchise fees levied by the Town.

### **Program Implementation**

Each component requires the implementation of certain education tasks to support the objectives of the component. While these stand-alone programs need

to be developed, an integrated approach is also needed. It will be necessary to ensure that the public receives proper information in a phased approach. In some instances, the information and education provided will be appropriate for more than one issue. The way information is disseminated might be similar for several components (brochures, newspaper), but what is actually said, and how, is important. Due to the nature and flexibility of the selected education and information alternatives, it will be relatively easy to modify or re-focus attention to any diversion short-fall.

Table 6-1 shows the selected tasks for public information and education, responsible agencies (government agencies and organizations), estimated costs associated with the tasks and implementation dates.

## **Monitoring and Evaluation Programs**

Town Staff as well as the Town's franchised collection company will be responsible for monitoring educational programs. Due to the small size of the community, Los Altos Hills is somewhat limited in the resources it can devote to this program. However, data collection and analysis for the Los Altos Hills area is also made easier because of the Town's size, and staff should be able to obtain a relatively good feeling for overall program performance.

Educational program success can be evaluated using one or more of the following indicators:

- Number of schools and students exposed to various programs;
- Number and size of community events and activities;
- Number and frequency of media publications;
- Qualitative feedback from waste generators about the information program;
- The quantity of waste diverted by programs publicized through education and public information activities;
- Costs per generator, per ton, or per "impression" for education and public information programs;
- The progress of the overall program toward diversion goals.

## **Responsible Agency**

Town Staff will be responsible for evaluating the success of the programs. A brief annual report, outlining the success of individual tasks, comparisons with neighboring communities, and plans for next year, will be the responsibility of this office. LAGCo will assist with the program evaluations where appropriate.

In addition to evaluating program performance based on the indicators outlined above, staff shall qualitatively evaluate educational programs according to the processes defined below.

*Formative* evaluation attempts to identify the strengths and weaknesses of the messages, materials, and educational or informational strategies before a program proceeds to full production, distribution or implementation. This is particularly important in the parts of a program that will require significant resources. Paid advertising, for example, can use up a great deal of a budget, and will be evaluated carefully before funds are committed.

*Process* evaluation assesses the organizational and administrative aspects of a program. *Outcome* and *impact* evaluation identify the immediate and longer term effects of efforts on the intended audience.

## **Monitoring Shortfalls**

If evaluation shows that specific diversion rates are not being achieved for certain programs and/or components, then expanding the education and information programs might be necessary. Methods that will be used to compensate for initial program shortcomings include:

- Increasing the frequency, type, or extent of program monitoring and review to discover the reasons why diversion rates are not achieved;
- Revising education and public information efforts to make them more effective based on results of evaluation;
- Expanding the education and public information programs by adding new components or increasing frequency;
- Publicizing new or additional incentives for participation in reduction, recycling, or composting programs.

It might be determined that the education and information aspects of the program are not what is preventing the individual programs from reaching their goals. If that is the case, the other programs will be modified accordingly to increase diversion.

**Table 6.1  
Public Education and Information Implementation Plan**

Town = Town of Los Altos Hills Public Works Department  
LAGCo = Los Altos Garbage Company  
County = Santa Clara County

<u>Task</u>	<u>Responsible Agency</u>	<u>Implementation Date</u>	<u>Yearly Cost</u>
<b>Short-Term</b>			
Expand general information about solid waste issues	Town/LAGCo	ongoing	included in other
Provide feedback on progress of waste reduction programs	Town	ongoing	none
Assist with educational materials for schools	Town/LAGCo	ongoing	\$200
Educate residents about the importance of "closing the loop"	Town/LAGCo	ongoing	included in other
Develop materials for self-haulers and debris box customers for yard-waste and construction materials reduction	Town/LAGCo	Sept. 1994	\$500
Expand information accompanying residential clean-ups	Town/LAGCo	ongoing	\$500
Develop and expand information on backyard composting programs	Town	Sept 1993	\$500
Publish directory of repair businesses	Town	Sept 1994	\$500
Enhance materials for curbside recycling programs	Town/LAGCo	ongoing	\$2500 LAGCo
Publish directory of brokers/end-users of recycled materials	Town	Sept 1994	\$250
Develop information that explains enforcement and protection	Town/LAGCo	Jan 1993	included in other
Enhance materials for proper disposal of special waste	Town/LAGCo	ongoing	included in other
Participate in county programs	Town/County	ongoing	not available
Expand HHW program information	Town/County	ongoing	\$500

**Table 6.1 (continued)**  
**Public Education and Information Implementation Plan**

Town = Town of Los Altos Hills Public Works Department  
LAGCo = Los Altos Garbage Company  
County = Santa Clara County

<u>Task</u>	<u>Responsible Agency</u>	<u>Implementation Date</u>	<u>Yearly Cost</u>
<b>Medium-Term</b>			
Develop information about the materials recovery facility	Town	March 1996	\$250
Develop materials to support self-haul programs	Town	Sept 1996	\$250

# **SOLID WASTE FACILITY COMPONENT**

## **Introduction**

Landfilling is the process of disposing of municipal solid waste onto land. Waste is compacted in layers and covered with soil or a suitable alternative. As the most common method of solid waste disposal today, landfilling will continue as the primary method of disposal of non-recyclable/non reusable wastes in Santa Clara County.

Because the amount of landfill capacity is declining throughout California and the amount of municipal solid waste is increasing, many landfills in the State have reached or are approaching capacity. The Source Reduction and Recycling Element includes a solid waste facility capacity component to ensure that there is adequate landfill capacity for disposing of the solid waste that cannot be diverted by recycling or composting.

The specific purpose of the Solid Waste Facility Capacity Component is to calculate the amount of disposal capacity required to meet the needs of the Town of Los Altos Hills for the next 15 years (calculated from the date of adoption of the SRRE). The component contains a description of the permitted solid waste disposal facilities currently used by the Town of Los Altos Hills. It includes projections of the Town's waste capacity needs for the next 15 years, and describes how the Town will satisfy future capacity needs. The solid waste reduction goals and implementation schedules described in Source Reduction, Recycling, Composting, and Special Waste sections of the Source Reduction and Recycling Element were incorporated into the projections of the Town's future disposal facility capacity needs.

## **Existing Solid Waste Disposal Conditions**

The required data (quantity and types of solid waste disposed, permitted capacity, remaining capacity, etc.) were verified with each landfill in April, 1991.

The required information includes:

- Owner and Operator
- Quantity and types of solid waste disposed
- Permitted site acreage
- Permitted capacity
- Current disposal fees
- For landfills, remaining capacity (in cubic yards and years)

## Existing Disposal Facilities

There are nine permitted landfills in operation in the county: Guadalupe, Kirby Canyon, Mountain View, Newby Island, Pacheco Pass, Palo Alto, Santa Clara (All Purpose), Sunnyvale, and Zanker Road. All are classified as Class III facilities. Four sites (Mountain View, Palo Alto, Santa Clara, and Sunnyvale) are publicly owned. The remaining five are privately owned: Guadalupe by the Guadalupe Rubbish Disposal Company; Kirby Canyon by Waste Management, Incorporated; Newby Island by International Disposal Corporation, a wholly owned subsidiary of Browning Ferris Industries; Pacheco Pass by South Valley Refuse Disposal; and Zanker Road by Zanker Road Resource Recovery Management Company, Limited. Except for the Palo Alto site, all landfills are privately operated.

According to the Santa Clara County Solid Waste Management Plan (1989 Revision), the County had between 24 and 32 years of remaining refuse capacity.

Using the current rate of fill of approximately 1.8 million tons per year, and an annual growth rate of 1.1%, the Plan projected 24 years of remaining capacity. With a 25% reduction in wastes landfilled by 1995 (the Plan's goal), the County had projected 32 years of remaining capacity.

Los Altos Hills currently generates approximately 8679 tons of solid waste annually. Accounting for an annual growth rate of approximately 1%, and a 25% waste-stream reduction by 1995, Los Altos Hills will dispose of approximately 5669 tons of waste by 1995, and 4462 tons of waste by 2000 with implementation of the SRRE programs.

### City of Mountain View Landfill

The Mountain View Landfill is owned by the City of Mountain View and operated by Wastech, Inc. Opened in 1930, the site was not heavily used until 1970 when the present sanitary landfill began operation. The landfill serves residents of Santa Clara County.

The 700-acre landfill is located at the north end of Shoreline Boulevard in Mountain View. In accordance with a detailed final-use plan, 550 acres of land have been filled, closed, and developed as the Shoreline Regional Park. The 150-acre active landfill is located adjacent to and south of the park. Other surrounding land uses include light industrial to the west and east, mixed residential, commercial, and industrial to the south, and Moffett Field Naval Air Station farther to the east. Access is via North Shoreline Boulevard.

The Class III site accepts only self-hauled residential, commercial, industrial, and demolition wastes for disposal. No hazardous or designated wastes may be accepted. According to the landfill operator, the site landfilled 9,702 tons (21,559 cubic yards) in 1990. Input tonnage is converted to in-place cubic yards by using a compaction factor of 900 pounds per cubic yard and a refuse to cover ratio of 5:1. Public disposal fees are \$4.50 per cubic yard (city residents), \$12.50 per cubic yard (non-residents), and \$18.50 per cubic yard (3-axle vehicles).

In 1984, Mountain View purchased the adjacent 70-acre Stierlin Road Landfill, also known as the Ferrari site. In mid-1988, due to permitting difficulties and

encroaching incompatible land uses, the City Council declared its intent to close the landfill. In November 1988, the communities of Sunnyvale, Cupertino, and Los Altos, and Los Altos Hills ceased using the landfill. The City of Mountain View has arranged to dispose of its franchised waste at the Newby Island Landfill until the completion of a north county transfer station.

In October 1988, the City Council decided to keep the original landfill open for use by the general public. This change of use requires a permit modification which the City is currently pursuing. The City has also indicated its intent to permit the adjacent 70-acre landfill for public use, provided that operations at the site do not create substantial inconveniences for adjacent parcels.

As of January 1991, the landfill had a remaining capacity of 150,000 tons (approximately 250,000 cubic yards).

A hydrogeologic report was done on the site by EMCON Associates in 1974. A hydrogeologic report was done on the Ferrari site by EMCON Associates in December of 1972. Current operating permits for the site include:

- CWMB Solid Waste Facility Permit (#43-AL 001 - March 10, 1978);
- RWQCB Waste Discharge Permits (Mountain View site: #78-11 as amended by #81-26 - May 20, 1981; and Stierlin Road site: #73-51 - August 28, 1973).

### **Newby Island Landfill**

The Newby Island Landfill is owned and operated by International Disposal Corporation, a wholly-owned subsidiary of Browning-Ferris Industries (BFI). The site was opened around 1930 as an open burning dump before being converted to a sanitary landfill in 1956. The facility presently accepts waste from the cities of San Jose, Milpitas, Cupertino, Los Altos, Mountain View, Santa Clara, the Town of Los Altos Hills, surrounding unincorporated areas, independent contractors, and the general public.

Located at the west end of Dixon Landing Road in north San Jose, the 342-acre site is bounded by Coyote Creek on the west, north, and east, and a slough tributary to Coyote Creek on the south. Surrounding land uses include salt evaporation ponds to the west, a wildlife refuge to the north, and sludge beds to the south. The property is zoned R3 - Residential. Access is provided via the Dixon Landing Road interchange off of Interstate 880.

The Class III landfill accepts garbage, rubbish, small dead animals, demolition, brush, stumps, large containers, and street refuse. No hazardous or designated wastes may be accepted.

According to the landfill operator, the facility landfilled 980,477 tons (approximately 4.7 million cubic yards) of waste in 1990. Input tonnage is converted to in-place cubic yards by using a compaction factor of 1,750 pounds per cubic yard and a refuse to cover ratio of 5 to 1. Public disposal fees (as of January 1991) range from \$2.35 to \$17.00 per cubic yard, with a minimum charge of \$ 12.90 per load. Tipping fees are \$15.05 per ton for franchised waste from the

City of San Jose and \$20.50 per ton for franchised waste from Cupertino, Los Altos, Los Altos Hills, Mountain View, and Santa Clara.

In August 1988, a proposed recycling facility, called The Recyclery, received final CoSWMP approval for construction adjacent to the Newby Island Landfill. In early 1991, The Recyclery received final permits and began operations. The Recyclery is capable of processing up to 800 tons of refuse daily, recovering more than half for recycling. The landfill site also has a methane recovery system in place with a design capacity of 2,000 KW.

BFI currently has contracts with the communities of Cupertino, Los Altos, Los Altos Hills, and Santa Clara, and adjacent unincorporated areas, to provide 30 years of disposal capacity. These communities began using the landfill in November 1988. The City of San Jose also has a 30-year contract for disposal capacity at Newby Island.

Newby Island has a permitted capacity of approximately 50.8 million cubic yards. With a remaining capacity of approximately 27.1 million cubic yards, and the opening of The Recyclery, the site is expected to remain in operation until at least 2020. Proposed use after closure is as an open space park.

A hydrogeologic report for the site was done by EMCON Associates in 1972 and by Purcell, Rhodes and Associates in 1979 and 1982. Current operating permits issued to the site include:

- CWMB Solid Waste Facility Permit (#43-AN-003 - Feb. 7, 1989); and
- RWQCB Waste Discharge Permit (#75-22, as amended by #82-4, #82-63, #82-64, and #87-152 - November 30, 1987).

### **Zanker Road Landfill**

Zanker Road Landfill is independently owned and operated by Zanker Road Resource Recovery Management Company, Limited. Prior to 1992, it was owned and operated by Zanker Resource Recovery, Incorporated, a wholly owned subsidiary of Norcal Waste Systems. Formerly known as the Nine Par Disposal Site, the facility was operated by the Nine-Par Company from 1934 to 1977. Zanker Road Resource Recovery reopened in 1985. The facility currently serves northern San Jose and surrounding communities.

Located west of the intersection of Zanker Road and Los Esteros Road in northern San Jose, the 70 acre site is bound by a wetland habitat to the north, the Leslie Salt Company evaporation ponds to the north and west, the Artesian Slough to the northwest, the San Jose/Santa Clara Water Pollution Control Plant to the south, and sludge ponds to the east. Access is provided via Los Esteros Road.

The Class III landfill accepts rubbish, brush/stumps, and demolition wastes for disposal. No garbage, hazardous, or designated wastes may be accepted, except asbestos (under certain conditions). According to the landfill operator, the facility landfilled 158,192 tons (263,653 cubic yards) of waste in 1990. Input tonnage is converted to in-place cubic yards by using a compaction factor of 1,200 pounds per in place cubic yard and a refuse to cover ratio of 4 to 1. Public disposal fees are \$3.00 to \$9.00 per cubic yard with a minimum charge of \$9.00.

Zanker Road Landfill conducts extensive recycling activities at the site, accepting incoming recyclable materials and pulling recyclables directly from the waste stream. On average, 80% of the total incoming waste stream is recycled.

The present 46-acre landfill has a permitted capacity of 3.2 million cubic yards. The site has a remaining capacity of 800,000 cubic yards (as of January 1, 1991), and is expected to remain in operation until 2005. The proposed use after closure is open space.

Hydrogeologic reports were done on the site by William C. Ellis, Consulting Geologist, in June 1975 (reviewed in August 1985), and by Woodward-Clyde. Current operating permits include:

- CWMB Solid Waste facility Permit (43-AN-007 - March 7, 1985);
- RWQCB Waste Discharge Permit (#85-132 as amended by #87-032 - May 1, 1987); and
- City of San Jose Land Use Permit (#PD87-1-7 - July 25, 1987).

## Disposal Facility Needs Projection

The disposal facility capacity needs projection provides an estimate of the disposal capacity (in tons/year) that is needed to accommodate projected solid waste for a 15-year period commencing in 1991 (or date of adoption of SRRE). This section of the SRRE describes the projected solid waste generation for this 15 year period. The following formula was used, as required by the California Integrated Waste Management Board, to project the Town of Los Altos Hills' projected capacity needs (expressed in cubic yards) over the next 15 years.

Capacity Needs Projection Equation: Annual Capacity year  $n = [(G + I) - (D + TC + LF + E)]$  year  $n$  where:

$G$  = the amount of solid waste projected to be generated in the Town of Los Altos Hills.

$I$  = the amount of solid waste which is expected to be imported to the jurisdiction for disposal in permitted solid waste disposal facilities through inter jurisdictional agreements with other cities or counties, or through agreements with disposal site owners

$D$  = the amount of solid waste diverted by implementation of proposed source reduction, recycling and composting programs

$TC$  = the amount of volume reduction occurring through available, permitted transformation facilities

$LF$  = the amount of permitted solid waste disposal capacity which is available for disposal in the jurisdiction, for solid waste generated in the jurisdiction

E = the amount of solid waste generated in the jurisdiction which is exported to solid waste disposal facilities in another jurisdiction (Note: According to the CIWMB, "other jurisdiction" refers to any city other than your own city.)

n = each year of a 15-year period commencing in 1991 (or the date of adoption of the SRRE) (iterative in one-year increments)

The above formula can be written as:

Capacity Needed year n = Waste generated + Waste Imported - (Waste diverted + Waste transformed/burned + Waste exported + Landfill capacity)

Results of the solid waste disposal facility needs projection are shown in Table 7-1. A compaction ratio of 4:1 is used in this table to convert weight (tons) to volume (cubic yards). The conversion factor has been cited by Newby Island Landfill operators as a practical ratio for converting the overall waste stream. These results indicate that the Town of Los Altos Hills will not require additional disposal capacity during the 15-year planning period. This assumption is contingent upon the achievement of the AB 939 diversion goals.

## **Disposal Facility Phase-Out or Closure**

The Town's current contract with Newby Island Landfill, together with the achievement of the projected waste diversion goals, will provide adequate disposal capacity through 2018.

By Resolution No. 52-89, the Town entered into an agreement with International Disposal Corporation of California, a subsidiary of Browning-Ferris Industries, Inc., for a long-term disposal agreement of municipal solid waste, through the year 2018. A copy of this agreement is presented at the end of this section.

## **Plans to Export Waste**

Since the disposal agreement with International Disposal Corporation of California is through the year 2018 there are no plans to deliver waste generated from the Town to any other facility other than the Newby Island Landfill.

## **New or Expanded Disposal Facilities**

There are no plans to establish a new disposal facility for the Town of Los Altos Hills during the short, medium or long-term planning periods.

Table 7.1

Solid Waste Disposal Needs

Year	Projected Growth Rate (%)	Tons Generated	Tons Imported	Minimum tons Reduced, Recycled, Composted	Tons Trans-formed	Tons Disposed in Town	Maximum Tons Disposed in Landfill	Maximum Cubic Yards Disposed in Landfill *
1991		8679	0	2433	0	0	6246	24,984
1992	1.002	8699	0	2502	0	0	6197	24,788
1993	1.002	8716	0	2571	0	0	6145	24,582
1994	1.002	8734	0	2663	0	0	6071	24,283
1995	1.006	8786	0	3117	0	0	5669	22,677
1996	1.006	8839	0	3639	0	0	5200	20,800
1997	1.006	8892	0	3944	0	0	4948	19,792
1998	1.006	8945	0	4199	0	0	4746	18,985
1999	1.006	8999	0	4410	0	0	4589	18,356
2000	1.006	9053	0	4591	0	0	4462	17,848
2001	1.000	9053	0	4591	0	0	4462	17,848
2002	1.000	9053	0	4591	0	0	4462	17,848
2003	1.000	9053	0	4591	0	0	4462	17,848
2004	1.000	9053	0	4591	0	0	4462	17,848
2005	1.000	9053	0	4591	0	0	4462	17,848

Given the remaining capacity at currently used landfills, the Town of Los Altos Hills does not foresee any problems with disposing of these projected levels of solid wastes.

\* Compaction ratio 4:1



**AGREEMENT FOR DISPOSAL OF MUNICIPAL SOLID WASTE**

**BETWEEN**

**THE CITY OF LOS ALTOS HILLS**

**AND**

**INTERNATIONAL DISPOSAL CORP. OF CALIFORNIA**



TABLE OF CONTENTS

SECTION	PAGE
RECITALS . . . . .	1
1. DEFINITIONS . . . . .	1
1.1 Allocation Quantity . . . . .	2
1.2 Ash . . . . .	2
1.3 Biomedical Waste . . . . .	2
1.4 City . . . . .	3
1.5 Clean Up Campaign . . . . .	3
1.6 Contractor . . . . .	3
1.7 Curbside Recycling Credit . . . . .	3
1.8 Curbside Recycling Program . . . . .	4
1.9 Debris Box . . . . .	4
1.10 Designated Hauler . . . . .	4
1.11 Disposal Facility . . . . .	4
1.12 Hazardous Waste . . . . .	4
1.13 Maintenance Waste . . . . .	6
1.14 Municipal Solid Waste . . . . .	6
1.15 Publicly Hauled Waste . . . . .	6
1.16 Rate Adjustment Date . . . . .	7
1.17 Recycling . . . . .	7
1.18 Recycling Incentive Taxes . . . . .	7
1.19 Regulatory Changes . . . . .	7
1.20 Residential Waste . . . . .	8
1.21 Santa Clara County Municipalities . . . . .	8
1.22 Taxes . . . . .	8
1.23 Tipping Fee . . . . .	9
1.24 Ton . . . . .	9
1.25 Transferree Municipality . . . . .	9
1.26 Waste-to-Energy Facility . . . . .	9
2. CITY'S RESPONSIBILITIES . . . . .	9
2.1 Delivery of Municipal Solid Waste . . . . .	9
2.2 Waste-to-Energy Facility . . . . .	10
2.3 Unauthorized Waste . . . . .	10
3. CONTRACTOR'S RESPONSIBILITIES . . . . .	10
3.1 Receipt of Municipal Solid Waste . . . . .	10
3.2 Operational Requirements . . . . .	11
3.2.1 Hours . . . . .	11
3.2.2 Signs . . . . .	11
3.2.3 Site Access . . . . .	11
3.2.4 Scales, Cubic Yard Conversion . . . . .	12
3.2.5 Records . . . . .	12
3.3 Designated Haulers . . . . .	13
3.3.1 Acceptance of Waste . . . . .	13
3.3.2 City Designation . . . . .	13
3.3.3 No Preference . . . . .	13
3.4 Curbside Recycling Programs . . . . .	13
3.4.1 Curbside Recycling Credit . . . . .	13
3.4.2 Contractor Curbside Recycling Program . . . . .	14
3.5 Unauthorized Waste . . . . .	15
3.6 Compliance with Laws and Regulations . . . . .	16
3.7 Permits, Licenses, Approvals . . . . .	16
3.7.1 Contractor to Obtain . . . . .	16
3.7.2 Closure Plan . . . . .	17
3.8 Inspection of Operations . . . . .	17
3.9 Labor Force . . . . .	18
3.9.1 Employment . . . . .	18
3.9.2 Safety Provisions . . . . .	18
3.10 Discrimination Prohibited . . . . .	18
4. TERM OF AGREEMENT . . . . .	19
4.1 Effective Date of Performance . . . . .	19
4.2 Termination . . . . .	19
5. COMPENSATION . . . . .	19
5.1 Tipping Fee . . . . .	19
5.2 Annual Adjustment of Tipping Fee . . . . .	19
5.3 City Recycle/Transfer Station . . . . .	22
5.4 Other Adjustments . . . . .	22
5.4.1 Regulatory Changes . . . . .	22
5.4.2 Termination by City . . . . .	23
5.4.3 City's Proportionate Share . . . . .	24
5.4.4 Taxes . . . . .	26
5.5 Payment . . . . .	26
5.5.1 Monthly Invoice and Report . . . . .	26
5.5.2 Time of City's Payment . . . . .	27
5.5.3 Payment for Publicly Hauled Waste . . . . .	28
5.6 Full Payment . . . . .	28

6.	ASSIGNMENT AND USE OF ALLOCATION QUANTITY . . . . .	28
7.	ASSURANCE OF PERFORMANCE. . . . .	29
	7.1 Force Majeure . . . . .	29
	7.1.1 Events Resulting in Force Majeure. . . . .	29
	7.1.2 Suspension of Obligations . . . . .	30
	7.1.3 Alternative Disposal Arrangements. . . . .	30
	7.2 Performance Bond . . . . .	31
	7.3 Insurance Requirements . . . . .	31
	7.4 Hold Harmless and Indemnification . . . . .	32
	7.4.1 By Contractor . . . . .	32
	7.4.2 By City . . . . .	33
	7.4.3 Negligence Defined . . . . .	34
	7.4.4 Notice and Access . . . . .	34
	7.4.5 Insurance Coverage . . . . .	35
	7.4.6 Survival . . . . .	35
	7.5 Suspension or Termination For Default . . . . .	35
8.	GENERAL PROVISIONS. . . . .	37
	8.1 Independent Contractor. . . . .	37
	8.2 City Warranty . . . . .	38
	8.3 Venue . . . . .	39
	8.4 Savings Clause . . . . .	39
	8.5 Section Headings . . . . .	39
	8.6 Amendment . . . . .	39
	8.7 Assignability . . . . .	39
	8.8 Notices . . . . .	40
	8.9 Waiver . . . . .	41
	8.10 Law to Govern . . . . .	41
	8.11 Attorney's Fees . . . . .	41
	8.12 Entirety . . . . .	41
	GUARANTEE . . . . .	43

EXHIBITS

"A"	Allocation Quantity
"B"	Unincorporated Geographic Area of Santa Clara County
"C"	Equivalent Weight of Municipal Solid Waste
"D"	Report of Refuse Received at the Recycling/Newby Island Landfill
"E"	Insurance Requirements

**AGREEMENT FOR DISPOSAL OF MUNICIPAL SOLID WASTE**

THIS AGREEMENT is made and entered into this \_\_\_\_\_ day of APR 11 1989 1989, by and between the CITY OF LOS ALTOS HILLS, CALIFORNIA, a California municipal corporation (herein "City"), and INTERNATIONAL DISPOSAL CORP. OF CALIFORNIA, a California corporation (herein "Contractor"), which is a wholly-owned subsidiary of Browning-Ferris Industries, Inc., a Delaware corporation.

**R E C I T A L S :**

WHEREAS, City desires to contract for recycling and long-term disposal of Municipal Solid Waste (as defined herein); and

WHEREAS, Contractor owns and operates the Newby Island sanitary landfill (the "Disposal Facility") and is in the process of establishing a recycling facility thereat; and

WHEREAS, City and Contractor desire that the Disposal Facility be maintained as a fully permitted disposal site in order to receive Municipal Solid Waste from City for recycling and disposal in accordance with this Agreement.

NOW THEREFORE, in consideration of the mutual promises, covenants and conditions contained in this Agreement, and for other good and valuable consideration, the parties to this Agreement hereby agree as follows.

**SECTION 1. Definitions.**

The following capitalized names and terms shall have the respective meanings indicated:

**1.1 Allocation Quantity**

"Allocation Quantity" means the maximum Tons of Municipal Solid Waste, calculated at the entrance to the Disposal Facility, which City shall be entitled to deliver or have delivered to the Disposal Facility for Recycling and/or disposal in accordance with this Agreement. City's Allocation Quantity is set forth in Exhibit "A", attached hereto and made a part hereof. City's Allocation Quantity shall not include amounts of Publicly Hauled Waste delivered to the Disposal Facility. City's Allocation Quantity shall include amounts of Municipal Solid Waste delivered to the Disposal Facility by or on behalf of a Transferee Municipality pursuant to Section 6.

**1.2 Ash**

"Ash" means the material remaining after incineration of Municipal Solid Waste, including bottom ash, fly ash and water.

**1.3 Biomedical Waste**

"Biomedical Waste" means waste which may be reasonably considered infectious, pathological or biohazardous, originating from hospitals, public or private medical clinics, departments or research laboratories, pharmaceutical industries, blood banks, forensic medical departments, mortuaries, veterinary facilities and other similar facilities and includes equipment, instruments, utensils, fomites, laboratory waste (including pathological specimens and fomites attendant thereto), surgical facilities, equipment, bedding and utensils (including pathological specimens and disposal fomites attendant thereto), sharps (hypodermic needles, syringes, etc.), dialysis unit waste, animal carcasses, offal and body parts, biological

materials, (vaccines, medicines, etc.) and other similar materials, but does not include any such waste which is determined by evidence reasonably satisfactory to Contractor to have been rendered non-infectious, non-pathological and non-biohazardous.

1.4 City

"City" means the City of Los Altos Hills, California, a municipal corporation organized under the laws of the State of California, all of the geographic area lying within the municipal boundaries of the City and all of the geographic area lying within such unincorporated areas of Santa Clara County, California as are set forth and described in Exhibit "B", attached hereto and made a part hereof.

1.5 Clean Up Campaign

"Clean Up Campaign" means the annual, semi-annual or other similar periodic program conducted by City, its agents and/or a Designated Hauler the purpose of which is to provide residents of City a means of disposing of bulky wastes and/or similar materials which are not collected through the regular Municipal Solid Waste collection service.

1.6 Contractor

"Contractor" means International Disposal Corp. of California, its successors and assigns.

1.7 Curbside Recycling Credit

"Curbside Recycling Credit" has the meaning set forth in subsection 3.4.1.

1.8 Curbside Recycling Program

"Curbside Recycling Program" means the collection of recyclable materials from Residential Waste in the same or similar manner as described in subsection 3.4.2.

1.9 Debris Box

"Debris Box" means a roll-off waste container used to collect, without compaction, construction debris and similar materials.

1.10 Designated Hauler

"Designated Hauler" means the waste haulers named by City pursuant to subsection 3.3.2 to deliver Municipal Solid Waste to the Disposal Facility.

1.11 Disposal Facility

"Disposal Facility" means the Newby Island sanitary landfill, located at 1601 Dixon Landing Road, San Jose, CA 95131.

1.12 Hazardous Waste

"Hazardous Waste" means any of the following:

(i) all waste defined or characterized as hazardous waste by the federal Solid Waste Disposal Act (42 U.S.C. Section 3251 et seq.), as amended, including the Resource Conservation and Recovery Act of 1976 (42 U.S.C. Section 6901 et seq.) and all future amendments thereto, or regulations promulgated thereunder;

(ii) all waste defined or characterized as hazardous waste by the principal agencies of the State of California

(including without limitation the Department of Health Services and the California Waste Management Board) having jurisdiction over hazardous waste generated by facilities within such State, and pursuant to any applicable State or local law or ordinance, and all future amendments thereto, or regulations promulgated thereunder;

- (iii) radioactive wastes;
- (iv) any sewage sludge or other residue from wastewater treatment facilities;
- (v) waste commonly known as cannery waste;
- (vi) those substances or items which require special or extraordinary handling or disposal due to their hazardous, harmful, toxic or dangerous character or quality; and
- (vii) those substances and items which are not normally expected to be disposed of by generally accepted sanitary landfill disposal methods.

"Hazardous Waste" shall be construed to have the broader, more encompassing definition where a conflict exists in the definitions employed by two or more governmental agencies having concurrent or overlapping jurisdiction over hazardous waste. If any governmental agency or unit having appropriate jurisdiction shall hereafter determine that substances which are not, as of the date hereof, considered harmful, toxic, dangerous or hazardous, are harmful, toxic, dangerous or hazardous, then such substances shall be Hazardous Waste for the purposes of this Agreement as of the effective date of such determination. If any governmental agency or unit having appropriate jurisdiction shall hereafter determine that substances which are, as of the

date hereof, considered harmful, toxic, dangerous or hazardous, are not harmful, toxic, dangerous or hazardous, then such substances shall not be Hazardous Waste for purposes of this Agreement as of the effective date of such determination.

1.13 Maintenance Waste

"Maintenance Waste" means the following materials collected by City maintenance employees or private contractors hired to collect such materials instead of such employees: (i) debris from street and sewer repairs, (ii) debris from street sweepings, (iii) grass clippings, leaves and tree trimmings from maintenance of city parks, streets, median strips and City property, (iv) rock and concrete, (v) asphalt pavement from streets and (vi) tree stumps.

1.14 Municipal Solid Waste

"Municipal Solid Waste" means all substances or materials that are generally discarded or rejected as being spent, useless, worthless or in excess to the owners at the time of rejection, including, without limitation, trash, garbage, refuse and rubbish, and which are generated by all residential, commercial, industrial, institutional, municipal, agricultural and other activities within the City; provided, however, Municipal Solid Waste does not include Hazardous Waste, Biomedical Waste and Ash.

1.15 Publicly Hauled Waste

"Publicly Hauled Waste" means Municipal Solid Waste generated at residences or commercial establishments in the City and hauled directly to an ultimate disposal site, including the Disposal Facility, by the respective generators (or, in the case of residences, their family members) of such Waste.

1.16 Rate Adjustment Date

"Rate Adjustment Date" has the meaning set forth in Section 5.2.

1.17 RECYCLERY

"The Recyclery" means a facility for Recycling to be located adjacent to the Disposal Facility, which, when fully operational, is expected to reduce disposable items in selected loads of Municipal Solid Waste delivered to the Disposal Facility.

1.18 Recycling

"Recycling" means the process of controlled manual and/or mechanical separation and removal of selected materials and items from any portion of a waste stream, such as, but not limited to, newspapers, cans, corrugated cardboard, metals, plastics and glass or the separate collecting of any such materials and items, for the purpose of reuse with or without reprocessing or remanufacturing into new products or for the purpose of composting.

1.19 Recycling Incentive Taxes

"Recycling Incentive Taxes" means those Taxes which are reducible, through a credit to Contractor or otherwise, based upon a reduction, due to Recycling, in the volume or weight of waste or material actually landfilled.

1.20 Regulatory Changes

"Regulatory Changes" means changes in laws or regulations (including enactment of new laws or regulations and permit changes) affecting the Disposal Facility or The Recyclery which occur on or after the date of this Agreement, and

changes in the enforcement or interpretation of present or future laws or regulations (including permits) affecting the Disposal Facility or The Recyclery which occur on or after the date of this Agreement.

1.21 Residential Waste

"Residential Waste" means Municipal Solid Waste generated at residences which would be expected to contain cans, glass, metals and other materials suitable for Recycling.

1.22 Santa Clara County Municipalities

"Santa Clara County Municipalities" means any city or town within Santa Clara County, California and Santa Clara County itself, acting on behalf of the unincorporated portions of said County.

1.23 Taxes

"Taxes" means all taxes or governmental fees now or hereafter imposed with respect to operation of The Recyclery and/or the Disposal Facility; provided, however, "Taxes" shall include the per unit stated amount of each tax or fee for all waste or material delivered to the Disposal Facility even though Contractor is able, through processing at The Recyclery or its manner of operation at or the characteristics of the Disposal Facility, to reduce, through receipt of a credit or otherwise, the related aggregate tax or fee actually payable by Contractor. As of the date of this Agreement, "Taxes" are \$4.04 per Ton, composed of the following: The current City of San Jose Business Tax of \$3.00 per ton, the City of San Jose Enforcement Fee of \$0.13 per ton, the County Solid Waste Planning Fee of \$0.15 per ton, the County Health Enforcement Fee of \$0.16 per ton, and the fee resulting from State AB 2448, California Government Code Section 66749, et. seq., known as the "Eastin Tax" (currently estimated to be \$0.60 per ton but

subject to retroactive adjustment based upon the actual tax).

1.24 Tipping Fee

"Tipping Fee" means the amount, as set forth in Section 5, payable by City to Contractor for each Ton of Municipal Solid Waste delivered to the Disposal Facility pursuant to this Agreement.

1.25 Ton

"Ton" means a short Ton of 2,000 pounds avoirdupois.

1.26 Transferee Municipality

"Transferee Municipality" means a Santa Clara County Municipality to which City has assigned part of City's Allocation Quantity in accordance with Section 6.

1.27 Waste-to-Energy Facility

"Waste-to-Energy Facility" means a facility at which waste is burned to produce steam for heat or electricity.

SECTION 2. CITY'S RESPONSIBILITIES

2.1 Delivery of Municipal Solid Waste

Subject to the other provisions of this Agreement, during the term of this Agreement, City shall deliver or cause delivery of all Municipal Solid Waste to the Disposal Facility, for Recycling and/or disposal in accordance with this Agreement; provided, however, City shall not be required to deliver or cause delivery of Municipal Solid Waste collected in Debris Boxes, Municipal Solid Waste collected pursuant to City's Clean Up Campaign, Publicly Hauled Waste, Maintenance Waste, Municipal Solid Waste

9471-2

- 9 -

collected pursuant to a Recycling program or Municipal Solid Waste delivered to a Waste-to-Energy Facility under Section 2.2.

2.2 Waste-to-Energy Facility

City may divert Municipal Solid Waste from the Disposal Facility to a Waste-to-Energy Facility; provided, however, that all Municipal Solid Waste which is delivered to, but is for any reason not incinerated at the said Waste-to-Energy Facility, shall be delivered to the Disposal Facility in accordance with Section 2.1. Any diversion of Municipal Solid Waste to a Waste-to-Energy Facility will not change the Tipping Fee at the Disposal Facility for Municipal Solid Waste. City may deliver or cause delivery of all resulting Ash to the Disposal Facility if regulations and permits allow for disposal of such Ash and subject to a mutually agreeable disposal rate. The price for Ash disposal will be negotiated at the time such a Waste-to-Energy Facility is in the planning phase.

2.3 Unauthorized Waste

City shall use reasonable business efforts to prevent delivery to the Disposal Facility by Designated Haulers of waste or material other than Municipal Solid Waste. Subject to Contractor's agreement, as set forth in Section 3.5, to attempt to reject or have a Designated Hauler remove such other waste or material, City shall pay all costs of handling, demurrage, reloading, transportation and/or disposal of such other waste or material.

SECTION 3. CONTRACTOR'S RESPONSIBILITIES

3.1 Receipt of Municipal Solid Waste

Subject to the other provisions of this Agreement, during the term of this Agreement, Contractor shall receive all

9471-2

- 10 -

Municipal Solid Waste delivered to The Recyclery and the Disposal Facility for Recycling and/or disposal at The Recyclery and Disposal Facility in accordance with this Agreement.

### 3.2 Operational Requirements.

#### 3.2.1 HOURS

Contractor shall operate the Disposal Facility for the receipt of Municipal Solid Waste from the Designated Haulers from at least 6:00 a.m. to 5:00 p.m. Monday through Friday and from 8:00 a.m. to 4:00 p.m. on Saturday, except that the Disposal Facility may be closed on Christmas Day, the fourth Thursday of November and New Year's Day.

#### 3.2.2 Signs

At Contractor's sole expense, Contractor shall prominently post signs at the entrance to the Disposal Facility detailing the regulations which must be followed by vehicles entering the site, indicating the hours of operation, the types of waste or recyclable materials accepted and a local telephone number to call for information or in case of emergency.

#### 3.2.3 Site Access

Contractor shall construct and maintain all roads running in and over the Disposal Facility as shall be reasonable under the circumstances, from the end of the public access road to the point designated for the disposal of materials. A smooth surface within the disposal area will be maintained properly to assist vehicles in their disposal operations.

Contractor shall designate an area immediately adjacent to an all-weather road for disposal during periods of inclement weather. Contractor shall operate and maintain such inclement weather site and shall construct and maintain an access road to such site. Contractor shall not be responsible for any expense or inconvenience incurred by Designated Haulers as a result of construction along the public access road. If delay occurs, Contractor and Designated Haulers shall attempt to arrange alternate scheduling.

#### 3.2.4 Scales; Cubic Yard Conversion

Contractor shall operate and maintain a scale or scales to weigh all Municipal Solid Waste delivered by Designated Haulers to the Disposal Facility. In the event that the scales are temporarily out of service to weigh Municipal Solid Waste delivered to the Disposal Facility, then, for the purposes of this Agreement, the Ton equivalent of cubic yards of waste, measured at the entrance of the Disposal Facility, shall be as set forth in Exhibit "C", attached hereto and made a part hereof.

#### 3.2.5 Records

Contractor shall maintain daily records for each Designated Hauler necessary to compile the monthly report to be provided by Contractor pursuant to subsection 5.5.1. City or City's designated representative shall have the right to inspect such records and the record keeping procedures at any time during normal business hours provided that such representative does not interfere with work being performed by Contractor.

3.3 Designated Haulers

3.3.1 Acceptance of Waste

Contractor shall accept all Municipal Solid Waste, not to exceed the Allocation Quantity, from City's Designated Haulers and shall charge City the Tipping Fee therefor.

3.3.2 City Designation

City shall designate those waste haulers responsible for delivery of Municipal Solid Waste to the Disposal Facility, provided that those so designated shall agree to observe all regulations at the Disposal Facility and to operate according to safe industry practices.

3.3.3 No Preference

Contractor shall give no preference or priority of treatment over Designated Haulers to any other persons bringing wastes to the Disposal Facility. Also, Contractor shall not give any preference or priority among Designated Haulers unless and until such preference or priority is requested by Contractor or City and approved in writing by the other party to this Agreement. Said approval shall not be unreasonably withheld.

3.4 Curbside Recycling Programs

3.4.1 Curbside Recycling Credit

City shall receive a credit against payments due Contractor under Section 5.5 in the amount of eighty cents (\$.80) (as adjusted under Section 5.2) per

month for each (and only each) single family residence in the City (the "Curbside Recycling Credit"); provided, however:

(i) City shall not receive the Curbside Recycling Credit from and after the later of:

(a) such date as City's Residential Waste can be processed through The Recyclery, provided that Contractor shall provide City with at least three (3) years prior written notice of such date and the Curbside Recycling Credit shall remain in effect during such three (3) year period, or

(b) the expiration of five (5) years from and after the date of this Agreement; and

(ii) Notwithstanding subparagraph (i) above, City shall not receive the Curbside Recycling Credit during such period as Contractor provides a Curbside Recycling Program in the City (including processing of Residential Waste at The Recyclery in lieu thereof), as set forth in subsection 3.4.2.

3.4.2 Contractor Curbside Recycling Program

At City's option, Contractor shall provide, at no additional cost to City, a Curbside Recycling Program, as described below; provided, however, Contractor shall not be required to provide such Curbside Recycling Program unless City shall have exercised such option in writing to Contractor within thirty (30) days after the date of this Agreement and the Cities of Santa Clara and/or Cupertino shall have

also properly exercised their respective options for Contractor to provide such Curbside Recycling Program for the same period; provided, further, the minimum term of such Curbside Recycling Program shall be the greater of seven (7) years or the remaining term of the hauling contract for Residential Waste between the City and its contractor hauler in effect on the date that such Curbside Recycling Program is to commence, except that Contractor may, at its option, terminate such Curbside Recycling Program at any time and process Residential Waste at The Recyclery.

The Curbside Recycling Program shall consist of the following and other mutually agreeable services and terms of performance: Contractor shall collect (at a minimum) glass, cans, PET bottles and newspapers once each week at curbside from all single family residences in the City and such multi-family residences which do not have dumpster or bin refuse collection service. All such recyclable material shall be placed in containers provided free of charge by Contractor. Contractor shall retain all the revenues derived from the sale of recyclable materials collected pursuant to the Curbside Recycling Program. Contractor shall have a period of one hundred eighty (180) days after City's exercise of its aforesaid option to commence provision of the Curbside Recycling Program.

### 3.5 Unauthorized Waste

In the event that waste or material other than Municipal Solid Waste is delivered or attempted to be delivered by Designated Haulers to the Disposal Facility, Contractor shall first attempt to reject such attempted delivery or cause the Designated Hauler, at its expense, to remove such waste or material from the Disposal Facility. However, in

the event that such delivery occurs and such waste or material is not so removed, Contractor shall promptly notify City thereof and, subject to City's payment of costs as set forth in subsection 2.3, use reasonable business efforts to comply with City's request for handling and transportation of such waste or material to a disposal facility that can lawfully accept it.

### 3.6 Compliance with Laws and Regulations

Subject to the other terms and conditions of this Agreement, including issuance of the authorizations set forth in Section 4.1, Contractor agrees that, in the operation of The Recyclery and the Disposal Facility and the performance of services under this Agreement, Contractor will qualify under, and comply with, any and all federal, state and local laws and regulations now in force and which may hereafter, during the term of this Agreement, be enacted and become effective, which are applicable to Contractor, its employees, agents, or subcontractors, if any, concerning the operation of The Recyclery and the Disposal Facility. However, Contractor shall have the right to contest in good faith the application of such law or regulation to The Recyclery and Disposal Facility and Contractor shall not be deemed in breach of this Agreement during such good faith contest for failure to comply.

### 3.7 Permits, Licenses, Approvals

#### 3.7.1 Contractor to Obtain

Subject to the other terms and conditions of this Agreement, including issuance of the authorizations set forth in Section 4.1, Contractor shall be responsible, at its sole expense, for obtaining and maintaining all necessary permits, licenses and approvals from any and all governmental entities

having jurisdiction over the Disposal Facility and The Recyclery in order that Contractor may operate the Disposal Facility and The Recyclery in accordance with the terms and conditions of this Agreement and any laws or regulations applicable to the Disposal Facility and The Recyclery. City shall fully cooperate with Contractor in obtaining and maintaining such permits, licenses and approvals as long as any out of pocket expense incurred by City is borne by Contractor. Contractor shall file with City a true and correct copy, certified by the granting agency, of each permit, license or approval. However, Contractor shall have the right to contest in good faith any requirement of a permit, license or approval necessary for the operation of the Disposal Facility and The Recyclery and Contractor shall not be deemed in breach of this Agreement during such good faith contest for failure to comply.

### 3.7.2 Closure Plan

Contractor shall demonstrate adequate financial responsibility sufficient to finance Contractor's closure and post closure plan as submitted to state and local permit enforcement agencies.

### 3.8 Inspection of Operations

The designated representative of City shall have the right to observe and review Contractor's operations and enter Contractor's premises at the Disposal Facility for the purpose of such observation and review during normal operating hours, subject to reasonable notice. This provision shall not be construed as giving to City any right to exercise control over the business or operations of Contractor or to direct any operations of Contractor or

to direct in any respect the manner in which the business and operations shall be conducted.

### 3.9 Labor Force

#### 3.9.1 Employment

Contractor shall employ only such superintendents, mechanics, and other workers who are careful, competent and fully qualified to perform the duties or tasks assigned to them. All workers shall have sufficient skill, ability and experience to properly perform the work assigned to them and to operate any equipment necessary for them to carry out their assigned duties properly.

#### 3.9.2 Safety Provisions

Contractor shall operate the Disposal Facility in compliance with all applicable federal, state and local laws and regulations pertaining to safety.

#### 3.10 Discrimination Prohibited

In the performance of this Agreement, Contractor will comply with the provisions of the California Fair Employment and Housing Act, California Government Code Section 12900 et seq., as amended, and any regulations promulgated thereunder, and with any federal statutes, and regulations promulgated thereunder, prohibiting employment discrimination.

**SECTION 4. TERM OF AGREEMENT**

**4.1 Effective Date of Performance**

Performance hereunder shall be deemed to have commenced on November 21, 1988.

**4.2 Termination**

Notwithstanding anything to the contrary contained in this Agreement, this Agreement shall continue in full force and effect until the first to occur of the following, unless sooner terminated in accordance with this Agreement:

- (i) the Allocation Quantity is depleted in accordance with this Agreement; or
- (ii) in any event, the expiration of thirty-five (35) years from and after the date of commencement of performance of this Agreement.

**SECTION 5. COMPENSATION**

**5.1 Tipping Fee**

The Tipping Fee for the disposal of Municipal Solid Waste at the Disposal Facility (including processing at The Recyclery and ultimate disposal of all processing residue at the Disposal Facility) initially shall be \$14.23 per Ton, which amount shall be adjusted in accordance with Sections 3.4, 5.2, 5.3 and 5.4.

**5.2 Annual Adjustment of Tipping Fee**

The Tipping Fee (as adjusted under Sections 3.4, 5.3 and 5.4) and the Curbside Recycling Credit shall be adjusted as of July 1 of each year, beginning as of July 1, 1989, (the

"Rate Adjustment Date") in accordance with the following formula:

$$P = A (.1 \times B + .1 \times C + .8 \times D)$$

A - The adjustable portion of the Tipping Fee (as described below) or, the Curbside Recycling Credit in effect as of the Rate Adjustment Date, as the case may be. The "adjustable portion of the Tipping Fee", as that phrase is used above, is the Tipping Fee in effect as of the Rate Adjustment Date, less the portion thereof attributable to Taxes. As of the date of this Agreement, the adjustable portion of the Tipping Fee is \$14.23.

B - The net percentage change in the Employment Cost Index (Compensation), Private Industry Workers - Nonmanufacturing, published by the U.S. Department of Labor, Bureau of Labor Statistics.

C - The net percentage change in the Gross National Product Implicit Price Deflator for Producer's Durable Equipment (non-residential), published quarterly by the U.S. Department of Commerce, Bureau of Economic Analysis.

D - The net percentage change in the Consumer Price Index (CPI), All Urban Consumer (CPI-U), for San Francisco-Oakland, California, published by the U.S. Department of Labor, Bureau of Labor Statistics.

P - The amount of adjustment to the Tipping Fee or the Curbside Recycling Credit, as the case may be, for the new twelve (12) month period.

All "net percentage changes", as that phrase is used above, are to be computed as the difference between the applicable index values for the month of March immediately prior to the current Rate Adjustment Date and for the month of March immediately prior to the last Rate Adjustment Date (March 1988 in the case of the first adjustment hereunder), divided by the index value for the month of March immediately prior to the last Rate Adjustment Date.

Contractor shall notify City in writing of any adjustment under this Section at the earliest practicable time. On the next billing date after the receipt of Contractor's statement showing adjustment under this Section, City shall pay to Contractor or Contractor shall credit to City, as the case may be, a lump sum equal to any increase or decrease applicable to that period which has elapsed during which the new Tipping Fee and the Curbside Recycling Credit is effective. Thereafter, the Tipping Fee charged by Contractor and the Curbside Recycling Credit shall not be modified to reflect any change under this Section until a subsequent adjustment statement is received by City. Adjustment to the Tipping Fee and the Curbside Recycling Credit will only be made in units of one cent (\$0.01). Fractions less than one cent (\$0.01) will not be considered in making adjustment.

Should the indices named in this Section not be published for March of any given year, the calculations shall be performed using the index value as published for the last month immediately preceding the March in question (or, in the case of a quarterly published index, the index value for the quarter including the March in question).

Should the indices named in this Section be discontinued, successor indices shall replace same. Successor indices shall be those indices which are most closely equivalent to the discontinued indices as recommended by the publishing agency.

### 5.3 City Recycle/Transfer Station

If after The Recyclery commences operation, City (including through its contractors or agents) engages in or causes the Recycling of any portion of Municipal Solid Waste (other than through a Curbside Recycling Program) or commingles any portion of Residential Waste and other Municipal Solid Waste prior to delivery to the Disposal Facility, the Tipping Fee for the resulting residue or commingled portions shall be increased by an amount equal to \$.88 plus the amount of Taxes excluded from the Tipping Fee adjustment under subsection 5.4.4. Such increase shall be subject to annual adjustments as specified in Section 5.2 beginning as of the Rate Adjustment Date. The Tipping Fee shall not be increased under this Section due to City's establishment of a Curbside Recycling Program, as set forth in Section 3.4, transfer stations within the City at which no Recycling (other than through buy back centers) or no commingling of Residential Waste and other Municipal Solid Waste occurs, or buy back centers within the City.

### 5.4 Other Adjustments

#### 5.4.1 Regulatory Changes

The Tipping Fee may be adjusted by Contractor from time to time to reflect City's pro rata share of all costs incurred or to be incurred by Contractor in operating The Recyclery and the Disposal Facility (including closure and post-closure monitoring) which are attributable to Regulatory Changes; provided, however, Contractor may not increase the Tipping Fee for costs attributable to any of the following:

- (i) Regulatory Changes, by their terms, imposed solely with respect to operation of a sanitary landfill located adjacent to San Francisco Bay;

(ii) existing regulatory or remedial work, monitoring or other work which is required due to refuse which was placed in the Disposal Facility prior to the beginning of this Agreement even if part of such wastes were generated in the City;

(iii) Contractor's intentional misconduct or negligent acts or omissions in operation of The Recyclery or the Disposal Facility;

(iv) compliance with the Calderon Legislation. (California Health & Safety Code Section 41805.5), subchapter 15, BANCARD Rule 34, Proposition 65, and California Administrative Code Titles 14 and 22, and the final version of EPA's Subtitle D criteria when it is enacted; provided, however, this subparagraph (iv) shall not include any future changes to the foregoing statutes, rules and/or regulations; and

(v) odor, noise and/or dust control due to encroaching land uses around the Disposal Facility which uses were not present on the date of this Agreement.

#### 5.4.2 Termination By City

If, upon any increase in the Tipping Fee under subsection 5.4.1 due to Regulatory Changes, the Tipping Fee (exclusive of Taxes and all adjustments under Section 5.2) exceeds, by thirty percent (30%) or more, the disposal rate (exclusive of taxes and adjustments for inflation) then payable pursuant to the long term disposal contract first entered into by any of the "North County Cities" for disposal of municipal solid waste at the Kirby Canyon Landfill in Santa Clara County, City shall have the option to terminate this Agreement without penalty; provided, however, City must exercise such option, if at all,

by providing Contractor with written notice thereof (including written evidence of the aforesaid percentage differential in disposal rates) within ninety (90) days after any such increase in the Tipping Fee. In the event that City properly exercises its aforesaid option, this Agreement shall terminate on the date as of which City has received all necessary regulatory approvals and made all necessary arrangements to process and/or dispose of elsewhere Municipal Solid Waste then being delivered hereunder to the Disposal Facility. As used above, "North County Cities" means the cities of Palo Alto, Sunnyvale and Mountain View, California.

#### 5.4.3 City's Proportionate Share

City's pro rata share of costs attributable to Regulatory Changes under subsection 5.4.1 shall be determined on the basis of either of the following:

(i) The percentage of the daily volume of wastes disposed of in the Disposal Facility or material processed at the Recyclery, as the case may be, which is attributable to City, for those costs which are, according to generally accepted accounting principles, attributable to the daily operating costs of the Disposal Facility or the Recyclery, as the case may be. The percentage of daily volume attributable to City, shall be based upon the average amounts during the one-year period immediately preceding the request for an adjustment pursuant to this Section; or

(ii) The percentage of the remaining total site capacity at the Disposal Facility or the

Percentage of material processed at the Recyclery, as the case may be, which is expected to be utilized by or attributable to City under this Agreement, for those costs which are, by generally accepted accounting principles, not attributable to the daily operating costs of the Disposal Facility or the Recyclery, as the case may be. If costs incurred by Contractor are amortized over several years, the increase in the Tipping Fee shall be repealed at the end of such amortization period. This repeal shall not affect other increases resulting from costs which were not amortized.

Contractor shall notify City of any Tipping Fee adjustment attributable to Regulatory Changes under this Section 5.4 at the earliest practicable time. At the time Contractor makes a request for a Tipping Fee adjustment attributable to Regulatory Changes pursuant to this Section 5.4, Contractor shall submit to City written documentation showing the actual costs incurred or estimated to be incurred in future years (for costs that are expected to be incurred or amortized over more than one year), demonstrating that the costs were incurred by reason of Contractor's compliance with changes in laws or regulations or changes in the enforcement or interpretation thereof, indicating the method of determining City's pro rata share of such cost, and showing the calculation of City's pro rata share. If Contractor bases the request for adjustment on a change in the enforcement or interpretation of a law or regulation affecting the Disposal Facility or the Recyclery, then Contractor shall also provide to City supporting documentation demonstrating the existence of and the nature of the change in enforcement or interpretation. City shall have the right, at reasonable times

and upon reasonable notice to Contractor, to inspect all records or other information contained therein pertaining to Contractor's request for adjustment under this Section 5.4. No increase in the Tipping Fee attributable to Regulatory Changes shall be made pursuant to this Section 5.4 unless and until Contractor has submitted the above described written documentation to City.

#### 5.4.4 Taxes

The Tipping Fee shall be adjusted by Contractor from time to time to include all Taxes; provided, however, except as set forth in Section 5.3, the Tipping Fee shall not include (i) 25% of Recycling Incentive Taxes imposed with respect to the volume of waste or material received or disposed of at the Disposal Facility and (ii) a mutually agreeable Percentage of Recycling Incentive Taxes imposed with respect to the weight of waste received or disposed of at the Disposal Facility, such mutually agreeable Percentage to be based upon the assumption that 25% of the volume of all Municipal Solid Waste delivered hereunder will be recycled at the Recyclery and upon the respective volume/weight relationships of the various components of Municipal Solid Waste being recycled at the Recyclery.

#### 5.5 Payment

##### 5.5.1 Monthly Invoice and Report

On or before the tenth (10th) day of each month, Contractor shall submit to City an invoice for the preceding month. Said invoice shall state the Tipping Fee then in effect and the amount due for the invoice month calculated in accordance with the provisions of this Section 5.

At the time Contractor submits the monthly invoice, Contractor shall also submit to City a report stating, for each Designated Hauler, the information in substantially the form of the sample report form attached hereto as Exhibit "D" and made a part hereof.

In the event City institutes a voucher system whereby City issues vouchers or coupons to Designated Haulers for delivery of Municipal Solid Waste, Contractor shall attach to the monthly report either copies of such list or the voucher numbers printed on such vouchers and the name of the Designated Hauler submitting the voucher.

#### 5.5.2 Time of City's Payment

City shall review the monthly invoice and the monthly report received from Contractor. City shall have ten (10) working days from receipt of the report to request reasonable additional information regarding the report. Such request shall be in writing and shall specify the information requested. Contractor shall have ten (10) working days from the date of the request to supply to City the requested additional information. City shall remit payment to Contractor with thirty (30) days of receipt of the requested information, or, if no additional information is requested, within thirty (30) days of receipt of the invoice and report. Where City disputes a portion of any invoice, City shall nevertheless timely pay in full the undisputed portion. City shall pay a charge for all past due amounts for each month or part thereof during which such amounts remain unpaid at the prime annual interest rate then established by Chase Manhattan Bank, N.A., but in no event higher than the maximum rate allowed by applicable law.

#### 5.5.3 Payment for Publicly Hauled Waste

Contractor shall accept Publicly Hauled Waste for disposal and shall require those delivering such waste to pay directly for disposal at a rate not more than that posted from time to time for deliveries of waste by the general public.

#### 5.6 Full Payment

Contractor hereby agrees to accept payments from City and those delivering Publicly Hauled Waste as described above as full compensation for services rendered under this Agreement.

#### SECTION 6. ASSIGNMENT AND USE OF ALLOCATION QUANTITY

City may, at its sole option, upon prior written notice to Contractor, and subject to the following conditions, assign to one or more other Santa Clara County Municipalities ("Transferee Municipality") a portion of City's remaining Allocation Quantity; provided, however:

- (i) Prior to any delivery of Municipal Solid Waste to the Disposal Facility, the Transferee Municipality shall enter into and be bound by the terms of this Agreement (with modifications set forth herein) with respect to such assigned portion of City's Allocation Quantity and, at Contractor's option, all state and local agencies having jurisdiction shall have approved the disposal at the Disposal Facility of the Transferee Municipality's Municipal Solid Waste contemplated by the Allocation Quantity assignment;
- (ii) City shall in any event remain responsible to perform all of its obligations under this Agreement, including, without limitation, under Section 2.1;

(iii) City's written notice to Contractor shall specify the exact amount of the Allocation Quantity assigned and the period over which deliveries of Municipal Solid Waste may occur;

(iv) The Transferee Municipality may not, during any calendar year, deliver or cause delivery of an amount of Municipal Solid Waste which, together with City's actual deliveries during such year, exceeds City's total Allocation Quantity (used and unused) divided by thirty (30); and

(v) The right of the Transferee Municipality to use the assigned portion of the Allocation Quantity shall end upon the expiration of thirty (30) years from and after the date of commencement of performance of this Agreement, even if all of said assigned portion has not, as of such time, been used by the Transferee Municipality.

#### SECTION 7. ASSURANCE OF PERFORMANCE

##### 7.1 Force Majeure

###### 7.1.1 Events Resulting in Force Majeure

The obligations of City and Contractor are subject to riots, wars, civil disturbances, insurrections, acts of terrorism at the Disposal Facility, epidemics, landslides, hurricanes, earthquakes, lightning, floods, washouts, explosions, fires, acts of God, government orders and regulations and other similar catastrophic events which are beyond the reasonable control of City or Contractor, as the case may be. It is specifically understood that "other similar catastrophic events" does not include, among other things, strikes, lockouts, other labor disturbances or breakage or accidents to machinery, equipment or plants.

###### 7.1.2 Suspension of Obligations

In the event either party is rendered unable, wholly or in part, by the occurrence of any event described in subsection 7.1.1 to carry out any of its obligations, then the obligations of such party, to the extent affected by such occurrence and to the extent that due diligence is being used to resume performance at the earliest practicable time, shall be suspended during the continuance of any inability so caused but for no longer period. Any time that such a party intends to rely upon the occurrence of an event described in subsection 7.1.1 to suspend obligations as provided in this Section 7, such party shall notify the other party as soon as reasonably possible, setting forth the particulars of the situation. Notice shall again be given when the effect of the occurrence of such event has ceased.

###### 7.1.3 Alternative Disposal Arrangements

In the event that Contractor fails or is unable to accept or dispose of any waste which it is obligated to accept or dispose of under the terms of this Agreement because of any event other than described in subsection 7.1.1 whose occurrence materially and adversely affects Contractor's ability to accept or dispose of such waste at the Disposal Facility, Contractor shall transport and dispose of such waste at an alternate landfill site or disposal facility selected by Contractor at no additional cost to City or in the alternative, at Contractor's option, shall reimburse City for any and all extra costs incurred by City, over and above the Tipping Fee, to haul and dispose of Solid Waste at such other location. Where City hauls or arranges for hauling of said waste, it is understood that these costs may include costs

incurred by the City which are payable by it to Designated Haulers for using an alternate landfill site. The provisions of this subsection 7.1.3 shall govern over any conflict with Section 7.5.

#### 7.2 Performance Bond

Contractor shall also make, execute and deliver to City a good and sufficient surety bond in a form reasonably satisfactory to City to secure the faithful performance by Contractor of the terms and conditions herein. Such bond shall be in the penal amount of One Hundred Thousand Dollars (\$100,000) and shall be for a term of at least two (2) years. Such bond shall be signed by the President or General Officer of Contractor, together with signature of its corporate secretary and corporate seal. The surety shall be a surety company duly authorized to do business in the State of California and acceptable to City. The surety company which issues the bond shall not be obligated to renew the bond after the expiration of the year term; provided, however, Contractor shall maintain similar replacement bonds issued by a mutually acceptable surety company meeting the requirements set forth above during the term of this Agreement. City agrees that Contractor's failure to replace the bond shall not result in City having any right to make a claim on the expiring bond. Notwithstanding the foregoing, Contractor may at any time, in lieu of the aforesaid surety bond, provide City with a letter of credit in the aforesaid sum, in a form reasonably satisfactory to City, securing the faithful performance by Contractor of the terms and conditions herein.

#### 7.3 Insurance Requirements

Contractor shall obtain and shall maintain throughout the term of this Agreement at least the minimum insurance policies, with at least the required coverage limits and

endorsements, as is set forth in Exhibit "E", entitled "INSURANCE REQUIREMENTS", attached hereto and made a part hereof. The insurance requirements set forth in Exhibit "E" shall be reviewed for sufficiency by City at two year intervals and such requirements may be reasonably amended or modified by City as deemed necessary or prudent by City, provided that any required new or increased coverage is available on a commercially reasonable basis.

Within (30) days of the effective date of this Agreement, Contractor shall submit proof of the aforesaid coverage in the form of Certificates of Insurance, with copies of all required endorsements attached thereto, to City.

#### 7.4 Hold Harmless and Indemnification

##### 7.4.1 By Contractor

Contractor agrees to protect, defend, hold harmless, and indemnify City, its Council, officers, employees, and agents from and against any and all liability, including but not limited to, contractual liability, losses, penalties, claims, demands, damages to property (real and/or personal), environmental contamination, including attorneys fees, and personal injury to or death of any person or persons, and all expenses resulting from any claim or cause of action of any nature, including clean up or remedial action sought by private or governmental parties, occurring by reason of:

- (i) Contractor's sole negligence;
- (ii) Contractor's comparative share of the joint negligence of the parties;
- (iii) Contractor's breach of this Agreement; or

(iv) Contractor's operation of The Recyclery and the Disposal Facility; provided, however, Contractor shall have no obligation of indemnity under this subsection 7.4.1(iv) (a) with respect to adjustments to the Tipping Fee authorized under Section 5.4 and (b) to the extent that the liability and expenses result from any of the events set forth in subsection 7.4.2.

#### 7.4.2 By City

City agrees to protect, defend, hold harmless and indemnify Contractor and its affiliated corporations, and their officers, employees, directors and agents from and against any and all liability, including but not limited to, contractual liability, losses, penalties, claims, demands, damages to property (real and/or personal), environmental contamination, including attorneys fees, and personal injury to or death of any person or persons, and all expenses resulting from any claim or cause of action of any nature, including clean up or remedial action sought by private or governmental parties, occurring by reason of:

- (i) City's sole negligence;
- (ii) City's comparative share of the joint negligence of the parties;
- (iii) City's breach of this Agreement; or
- (iv) Delivery by City or its agents (including Designated Haulers) of materials or substances to the Disposal Facility which are not Municipal Solid Waste.

#### 7.4.3 Negligence Defined

For purposes of Sections 7.4.1 and 7.4.2, "negligence" shall be deemed to include both negligent acts and omissions and willful misconduct, and the negligence of a party shall include the negligence of its respective officers, employees or agents (including subcontractors).

#### 7.4.4 Notice and Access

The party claiming a right to indemnity shall:

- (i) give written notice thereof within a reasonable period following the earlier of actual or constructive notice of the event or occurrence as to which the right to indemnification is or may be asserted, provided, that any delay in or failure to give such notice shall not alter any obligation of indemnity herein, except to the extent the indemnifying party is materially prejudiced thereby; and
- (ii) allow the other party (including their employees, agents and counsel) reasonable access to any of its employees, property and records reasonably related to the matter giving rise to the claim for indemnification (excluding records protected by the privilege applicable to communications between attorney and client and the work product of attorneys) for the purpose of conducting an investigation of such claim and taking such other steps as may be necessary to preserve evidence of the occurrence on which the claim is based.

#### 7.4.5 Insurance Coverage

Provision of the insurance coverage set forth in Section 7.3 does not relieve Contractor or its subcontractors from liability under the above hold harmless/indemnification clause.

#### 7.4.6 Survival

The indemnities contained in this Section 7 shall survive expiration or termination of this Agreement.

#### 7.5 Suspension or Termination For Default

City shall not suspend or terminate this Agreement unless and until Contractor has failed to substantially perform under this Agreement and has been given notice of such failure and has not cured such failure, or commenced to cure such failure, within thirty (30) days after receipt of said notice (and, in the case of commencement to cure, does not thereafter diligently proceed to cure such failure); provided that no opportunity to cure prior to suspension shall be required if the health, welfare, or safety of the public is endangered by the continued delivery of Municipal Solid Waste to the Disposal Facility.

A copy of the suspension order or action of the City shall be served on Contractor and on Contractor's surety (if there is a surety). When work is suspended for any cause or causes during the term of this Agreement, Contractor shall discontinue the work or such part thereof as City shall designate, whereupon the surety may, at its option, assume this Agreement or that portion thereof which City has ordered Contractor to discontinue, and may perform the same or may sublet the work or that portion of the work taken over to a contractor approved in writing by City's Director of Public Works; provided, however, that the

surety shall exercise its option and begin performance of the work, if at all, within thirty (30) days after the written notice to discontinue the work has been served upon Contractor and upon the surety or its authorized agent. The surety, in such event, shall assume Contractor's place in all respects and shall be bound by all the terms and conditions of this Agreement. The surety shall be paid by City for all work performed by it in accordance with the terms of this Agreement.

In case the Surety does not, within the above specified time, assume Contractor's responsibilities under this Agreement, or that portion thereof which City has ordered Contractor to discontinue, then City shall have the power and right to perform and complete, by contract or otherwise, as it may determine, the work herein described or such part thereof as it may deem necessary, and Contractor agrees that City shall have the right to procure equipment, labor and materials necessary for the completion of the work. City shall be required to mitigate expenses, in accordance with applicable law, for the work of completing the services provided in this Agreement, and the expense to City for same shall be the actual cost to City of such work, plus any additional costs which City may incur in payment to its Designated Haulers should the alternate disposal site be located at greater distance from the point of collection of Municipal Solid Waste than the Disposal Facility.

In case such expenses shall exceed the amount which would have been payable under this Agreement if the same had been fully performed by Contractor, then Contractor and its surety shall pay the amount of such excess to City on notice from City of the excess due. When any particular part of the work is carried out by the surety or by City, by contract or otherwise, under the provisions of this

Section, Contractor shall continue the remainder of the work in conformity with the terms of this Agreement.

In all instances, Contractor and its surety shall be liable for all damages incurred by City during the period after notice to discontinue the work has been served upon Contractor and the surety; provided, however, notwithstanding anything to the contrary contained in this Agreement, Contractor shall not be liable to City for any special, punitive or consequential damages, whether in contract, tort, strict liability or otherwise.

In computing damages which City incurs under this Section, additional costs of haulage of waste to a more distant site for waste disposal shall be included, as well as actual fees charged for disposal. Such additional haulage costs shall be negotiated in good faith between City and its Designated Haulers, and shall be passed on to surety and Contractor without markup.

#### SECTION 8. GENERAL PROVISIONS

##### 8.1 Independent Contractor

It is expressly understood and agreed that Contractor shall perform all work and services described herein as an independent contractor and not as an officer, agent, servant or employee of City; that Contractor shall have exclusive control of and the exclusive right to control the details of the services and work performed hereunder and all persons performing the same; that Contractor shall be solely responsible for the acts and omissions of its officers, agents, employees, contractors and subcontractors, if any; and that nothing herein shall be construed as creating a partnership or joint venture between City and Contractor. No person performing any of the work or

services described hereunder shall be considered an officer, agent, servant or employee of City, nor shall any such person be entitled to any benefits available or granted to employees of City.

##### 8.2 City Warranty

City warrants to Contractor that

- (i) City has full power in accordance with applicable law to enter into this Agreement;
- (ii) the entering into this Agreement will not constitute a violation or breach by City
- (a) of any contract or other instrument to which the City is a party,
- (b) of any judgment, order, writ, injunction or decree issued against or imposed upon City, or
- (c) that will result in a violation of any applicable law, order, rule or regulation of any governmental authority; and
- (iii) this Agreement constitutes a valid and binding obligation of City in accordance with its terms, including, without limitation, for the full period of the term of this Agreement notwithstanding the future change of elected or appointed City officials or the City's failure to budget and appropriate sufficient funds for this Agreement. Prior to the parties' entering into this Agreement, legal counsel for the City shall render a written legal opinion to Contractor that the matters set forth in this Section 8.2 are true and correct.

8.3 Venue

The parties agree that should any action, whether real or asserted, at law or in equity, arise out of the terms and conditions of this Agreement, venue for said action shall be in Santa Clara County, California.

8.4 Savings Clause

If any nonmaterial provision of this Agreement shall for any reason be held to be invalid or unenforceable, the invalidity or unenforceability of such provision shall not affect any of the remaining provisions of this Agreement and this Agreement shall be enforced as if such invalid and unenforceable provision had not been contained herein.

8.5 Section Headings

The Section and paragraph headings contained herein and the table of contents attached hereto are for convenience in reference and are not intended to define or limit the scope of any provision of this Agreement.

8.6 Amendment

This Agreement may be amended only by written agreement duly authorized and executed by the parties hereto.

8.7 Assignability

This Agreement is assignable with the written consent of both parties and shall be binding upon and insure to the benefit of the parties hereto and their respective heirs, successors in interest, and assigns. Such consent shall not be withheld unreasonably, nor shall such consent be required in the event of any of the following: (i) an assignment by operation of law, (ii) an assignment to an

affiliate or subsidiary of Contractor, (iii) an assignment of the right to use a portion of City's Allocation Quantity pursuant to Section 6 of this Agreement, or (iv) an assignment by City to the State of California or to any agency or subdivision of the State or of City if such entity undertakes responsibility of the disposal of Municipal Solid Wastes; provided, however, assignor shall remain responsible for performance of its obligations under this Agreement.

8.8 Notices

Notices by either party to this Agreement to the other party shall be deemed given if personally served or if sent by express mail or deposited in the United States Mail as certified mail, return receipt requested, postage prepaid, addressed to the other party as designated below, or to such other place designated in writing. Such notice shall be deemed effective on the date personally served or when actually received. Notice that a party intends to rely upon the occurrence of an event described in subsection 7.1.1 hereof to suspend obligations under this Agreement may be given verbally; provided that written notice is provided immediately following such verbal notification.

To City:

City Manager  
26379 Fremont Rd.  
Los Altos Hills, California 94022

To Contractor:

District Manager  
Browning-Ferris Industries  
of California, Inc.  
P.O. Box 1987  
San Jose, CA 95109

Regional Landfill Manager  
Browning-Ferris Industries  
of California, Inc.  
55 Almaden Boulevard  
San Jose, CA 95113

Secretary  
Browning-Ferris Industries  
of California, Inc.  
P.O. Box 3151  
Houston, TX 77253

8.9 Waiver

A waiver of any breach of any provision of this Agreement shall not constitute or operate as a waiver of any other breach of such provision or of any other provision, nor shall any failure to enforce any provision hereof operate as a waiver of such provision or of any other provision.

8.10 Law to Govern

It is understood and agreed by the parties that the law of the State of California shall govern the rights, obligations, duties and liabilities of the parties to this Agreement and shall govern the interpretation of this Agreement.

8.11 Attorney's Fees

In the event legal action is instituted to enforce this Agreement the prevailing party shall be entitled to reasonable attorneys' fees and actual costs incurred in connection with such action.

8.12 Entirety

The parties agree that this Agreement represents the full and entire agreement between the parties to this Agreement with respect to matters covered herein.

THE PARTIES TO THIS AGREEMENT hereby indicate their acknowledgment and acceptance of the terms and conditions stated herein by the following signatures of their duly authorized representatives.

APPROVED AS TO FORM AND LEGALITY:

CITY OF LOS ALTOS HILLS,  
CALIFORNIA,  
a municipal corporation

By: [Signature]  
Name: \_\_\_\_\_  
Title: City Attorney

By: [Signature]  
Name: \_\_\_\_\_  
Title: Mayor

ATTEST:  
By: [Signature]  
Name: \_\_\_\_\_  
Title: City Clerk

By: [Signature]  
Name: William E. Ryan  
Title: City Manager

26379 Fremont Road  
Los Altos Hills,  
California 94022

"City"

ATTEST:

INTERNATIONAL DISPOSAL CORP.  
OF CALIFORNIA

By: [Signature]  
Name: Suzanne F. Good  
Title: Notary Public

By: [Signature]  
Name: Gene A. Meredith  
Title: President



55 Almaden Boulevard  
San Jose, California 95113  
Telephone: (408) 432-1234

"Contractor"  
APPROVED:

APPROVED AS TO FORM AND LEGALITY:

COUNTY OF SANTA CLARA, CALIFORNIA

By: [Signature]  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_

By: [Signature]  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_

**GUARANTEE**

Browning-Ferris Industries of California, Inc., a California  
corporation, which is a wholly owned subsidiary of Browning-  
Ferris Industries, Inc., a Delaware corporation, hereby guaran-  
tees to City the performance by International Disposal Corp. of  
California of its obligations under this Agreement.

**BROWNING-FERRIS INDUSTRIES  
OF CALIFORNIA, INC.**

By:   
Name: Gene A. Meredith  
Title: President

EXHIBIT "A"

ALLOCATION QUANTITY

City of Los Altos Hills, California

250,000 Tons

(annual usage estimate - 8,500 tons)

APPROVED AS TO FORM AND LEGALITY:

CITY OF LOS ALTOS HILLS,  
CALIFORNIA,  
a municipal corporation

By: Frank Bullio  
Name: \_\_\_\_\_  
Title: City Attorney

By: William Elton  
Name: \_\_\_\_\_  
Title: Mayor

ATTEST:  
By: Peter J. Good  
Name: \_\_\_\_\_  
Title: City Clerk

By: William Elton  
Name: WILLIAM ELTON  
Title: City Manager

26379 Fremont Road  
Los Altos Hills,  
California 94022

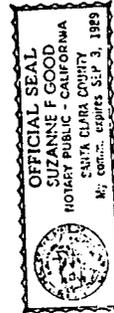
"City"

ATTEST:

By: Suzanne F. Good  
Name: \_\_\_\_\_  
Title: Notary Public

INTERNATIONAL DISPOSAL CORP.  
OF CALIFORNIA

By: Gene A. Meredith  
Name: \_\_\_\_\_  
Title: President



55 Almaden Boulevard  
San Jose, California 95113  
Telephone: (408) 432-1234

"Contractor"

9471-2

EXHIBIT "B"

UNINCORPORATED GEOGRAPHIC AREA OF  
SANTA CLARA COUNTY  
INCLUDED WITHIN DEFINITION OF CITY

See attached map and related description.

APPROVED AS TO FORM AND LEGALITY:

CITY OF LOS ALTOS HILLS,  
CALIFORNIA,  
a municipal corporation

By: Frank Bullio  
Name: \_\_\_\_\_  
Title: City Attorney

By: William Elton  
Name: \_\_\_\_\_  
Title: Mayor

ATTEST:  
By: Peter J. Good  
Name: \_\_\_\_\_  
Title: City Clerk

By: William Elton  
Name: \_\_\_\_\_  
Title: City Manager

26379 Fremont Road  
Los Altos Hills,  
California 94022

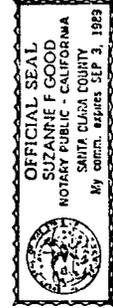
"City"

ATTEST:

By: Suzanne F. Good  
Name: \_\_\_\_\_  
Title: Notary Public

INTERNATIONAL DISPOSAL CORP.  
OF CALIFORNIA

By: Gene A. Meredith  
Name: \_\_\_\_\_  
Title: President



55 Almaden Boulevard  
San Jose, California 95113  
Telephone: (408) 432-1234

"Contractor"

9471-2

**EXHIBIT "C"**

**EQUIVALENT WEIGHT  
OF MUNICIPAL SOLID WASTE**

<u>Type of Refuse</u>	<u>Ton Equivalent Per Cubic Yard</u>
1. Compacted Refuse	
a. Front Loader or Side Loader Vehicle	.20 Ton/Cubic Yard
b. Rear Loader Vehicle	.30 Ton/Cubic Yard
c. Roll-Off Compactor Container	.40 Ton/Cubic Yard
2. Loose Refuse	.20 Ton/Cubic Yard
3. Demolition Refuse	.50 Ton/Cubic Yard
4. Concrete, Asphalt, Soil	1.00 Ton/Cubic Yard

**EXHIBIT "D"**

**REPORT OF REFUSE RECEIVED AT  
THE RECYCLERY/HERBY ISLAND LANDFILL  
ATTRIBUTABLE TO THE CITY OF LOS ALTOS HILLS, CALIFORNIA**

**DESIGNATED HAULER**

**MONTH OF**

TONS RECEIVED AT RECYCLERY	TONS RECEIVED AT RECYCLERY	DATE	NUMBER OF TRUCKS	TOTAL TONS	RATE (\$/TON)	OF TOTAL COST	MONTHLY TOTAL

EXHIBIT "E"

INSURANCE REQUIREMENTS

- A. (1) AN EXTENDED BROAD FORM MINIMUM COMPREHENSIVE GENERAL LIABILITY INSURANCE POLICY covering Bodily Injury and Property Damage with a combined single limit of at least Five Million Dollars (\$5,000,000) per occurrence providing the following coverages:
- (a) Premises Operations
  - (b) Independent Contractors
  - (c) Contractual Liability (for liability of others assumed by the Subcontractor in the contract between the Subcontractor and Contractor).
  - (d) Property Damage Liability arising out of the "XCU" hazards (explosion, collapse and underground damage).
  - (e) Completed Operations - Products
  - (f) Broad Form Property Damage Endorsement
  - (g) Personal Injury Endorsement
- (2) A WORKERS' COMPENSATION AND EMPLOYERS' LIABILITY POLICY (if required by State law) written in accordance with the laws of the State of California and providing the following coverages for any and all employees of Contractor:
- (a) Statutory Workers' Compensation Coverage A (statutory limit).
  - (b) Employers' Liability Insurance - Coverage B. Not less than: \$100,000 each accident/BI, \$500,000 policy limit BI by disease and \$100,000 each employee BI by disease.
- (3) A COMPREHENSIVE AUTOMOBILE POLICY with a minimum combined limit of not less than One Million Dollars (\$1,000,000) for bodily injury and property damage, applicable to vehicles used pursuant of any of the activities associated with this Agreement and providing the following coverages (without deductibles):

- (a) All owned vehicles
- (b) Employer's Non-ownership Liability
- (c) Hired Automobiles

(4) ENDORSEMENTS AND CLAUSES. All of the following clauses and endorsements, or similar provisions, are required to be made a part of each of the above required policies:

- (a) A "Cross Liability" or "Severability of Interest" clause; and
- (b) City, its employees, officers, agents and contractors are hereby added as additional insured as respects all liabilities arising out of Contractor's negligence or willful misconduct during performance of work under this Agreement; and
- (c) This policy shall be considered primary insurance as respects any other valid and collectible insurance City may possess, including any self-insured retention City may have, and any other insurance City possesses shall be considered excess insurance only; and
- (d) NO CANCELLATION OR NON-RENEWAL OF THIS POLICY OR MODIFICATION OF THE COVERAGE AFFORDED UNDER THIS ENDORSEMENT SHALL BE EFFECTIVE UNTIL WRITTEN NOTICE HAS BEEN GIVEN AT LEAST THIRTY (30) DAYS PRIOR TO THE EFFECTIVE DATE OF SUCH MODIFICATION OR CANCELLATION TO THE CITY OF LOS ALTOS HILLS, CALIFORNIA. ATTENTION: CITY MANAGER

B. PROOF OF INSURANCE COVERAGE AND COVERAGE VERIFICATION. A copy of the Certificate of Insurance and completed coverage verification shall be provided to City by each of the Contractor's insurance companies as evidence of the stipulated coverages within thirty (30) days of the effective day of this Agreement. The Certificate(s) of Insurance and coverage verification shall be mailed to City.



# FUNDING COMPONENT

## Introduction

The solid waste management programs delineated throughout this SRRE require adequate funding for implementation and continuation. Without financial support for the programs outlined, Los Altos Hills will not be able to reach its diversion goals. In the state of California, there are typically three sources of funding for solid waste management systems. These funding sources are:

- *Tipping fees*—the amount charged by a transfer station, landfill, or transformation facility to accept a specified amount of waste (usually defined in terms of tons or cubic yards).
- *Property taxes*—those taxes that are levied on the person or corporation recorded on the deed of record. Property taxes have limitations such as (1) statutory ceilings on tax rates, (2) competing public services such as public education, (3) lack of income or economic activity to support higher taxes, and (4) lack of voter support.
- *User fees*—fees applied to household waste and industrial waste. User fees assess the actual user based on weight and volume or number of containers collected.

In many communities, solid waste collection services are franchised out to independent contractors. These contractors collect money from residents (user fees), and pay a percentage or a fixed amount of all monies collected to the local governmental jurisdiction.

This component of the SRRE demonstrates how the Town of Los Altos Hills has sufficient funds for the planning, development, and implementation of the solid waste programs identified in this document to include source reduction, recycling, composting, special waste and public education programs. This section provides a description of the mechanisms used to fund ongoing solid waste programs, and estimates costs for the planning, development, and implementation of new programs. In addition, this section lists other future revenue sources that Los Altos Hills could potentially use to obtain adequate funding levels.

## Current Funding Sources

Los Altos Hills currently franchises its solid waste collection operations to the Los Altos Garbage Company, a wholly owned subsidiary of Norcal Waste Systems. The Town receives money from the garbage company in the form of franchise fees. Los Altos Garbage Company collects the Town's solid waste, and then returns approximately 10% of these collected monies to the Town. In addition to franchise fees, Los Altos Garbage Company allocates additional collected monies to the Town

in the form of disposal fees. These fees are designed to cover the cost of solid waste disposal, which the Town pays directly to the landfills where Town refuse is disposed.

Solid waste programs currently administered and operated by the Los Altos Garbage Company and paid for by residents include:

1. Residential refuse collection;
2. Universal curbside recycling service;
3. Yard-waste drop-off and collection program (for the collection and subsequent composting of yard-waste);
4. Quarterly clean-up days

In addition to these programs, the Town of Los Altos Hills uses its franchise and disposal fees to sponsor the following:

1. Yard-waste drop off program (this program is paid for directly by Town residents, as well as by Town Hall monies);
2. Community educational efforts, including the distribution of pamphlets, brochures, and newsletters detailing solid waste activities and options;
3. Hazardous Household waste programs (includes education, and collection efforts).

## **Estimated Costs of Selected Programs**

Costs have been estimated for each of the new or expanded programs identified in Sections 2 through 6 of this document. Table 8-1 shows the estimated annual capital and operating costs for each of these programs for the short-term planning period (1991-1995). Costs for the medium-term planning period are expected to be similar to those for the short-term, but may be greater or lesser depending on the level of success achieved in the short-term. Capital costs include equipment purchases, and new or improved structures. Operating costs include operations and maintenance, publications, other promotional materials, staff time, and those costs that will be incurred by the Town of Los Altos Hills.

Due to the small size and residential nature of the community, Los Altos Hills will not retain any new staff personnel for the sole purpose of solid waste management. However, the Director of Public Works will oversee all solid waste activity, and will be responsible for making adjustments to the program as they become necessary.

## **Revenue Sources for Selected Programs**

Monies collected through solid waste franchise and disposal fees will be used to finance all solid waste programs. Currently, residential rates cover the cost of curbside recycling and standard residential refuse collection. Residential rates also

cover a portion of the yard-waste collection service. Franchise and disposal fees (which are ultimately derived from residential fee collection) cover the costs of all Town sponsored programs.

### **Rate Increases**

Approved programs are generally funded from adjustments to collection rates for Town residents and commercial establishments. At the time Town staff negotiate with their service provider for a new program or program expansion, a funding source for that service is also identified. When the program receives its final approval, the City Council also authorizes a rate adjustment to fund the necessary costs of the program. Some costs may be amortized over several years.

### **Revenue from Sale of Materials**

Sales of recovered materials are used to help offset the cost of the residential curbside program currently provided to Town residents. Revenue from the sale of recyclable materials has the potential of providing a major source of funding for future programs. However, the low value of many materials and unpredictable markets have limited their importance as a realistic funding source.

### **Countywide AB 939 Tonnage Fee**

A countywide AB 939 tonnage fee is under investigation to assist in funding the Town's public information programs. The fee would be apportioned among each jurisdiction according to a formula which considers each jurisdiction's documented tonnage and population.

Solid waste related revenue sources provide sufficient revenue to fund all integrated waste management programs. These sources and their revenue contributions to the Solid Waste Fund for 1990-91 and 1991-92 are as follows:

<u>Source</u>	<u>1990-91</u>	<u>1991-92</u>
Customer Charges	\$205,704	\$211,875
Curbside Recycling Credit	\$28,296	\$28,296
AB 939 Fee	\$0	\$0
Total Solid Waste Fund	\$234,000	\$240,171

### **Customer Charges**

Customers, both residential and commercial, are charged for garbage collection based on quantity collected and collection frequency. The hauler (Los Altos Garbage Company) does the billing and pays the Town a ten percent (10%) franchise fee.

### **Curbside Recycling Credit**

A curbside recycling credit is paid to the Town by Newby Island Landfill operator, IDC/BFI. The current credit in fiscal year 1991-92 is \$0.90 per single family household per month. This generated \$28,296.

## AB 939 Fees

The Town is allowed to charge fees for implementation of AB 939 programs. In fiscal year 1992-93, a countywide fee will be implemented which will provide new revenue for AB 939 programs.

## Contingency Funding Sources

No major capital costs are anticipated. However, in the event that current budgetary constraints prevent the Town from meeting its diversion goals, collection rates could be increased as necessary to cover program costs.

If increased rates alone will not sufficiently cover program costs, or if rate increases are not politically desirable, several other funding options could be applied. These options include:

- *Short-term Special Taxes or Advance Disposal Fees.* Short-term special taxes or advanced disposal fees could be imposed to support recycling of difficult-to-recycle materials such as tires or plastic packaging materials. Special taxes or fees could be placed on materials or products that have been identified as difficult-to-recycle or in some other way pose a special disposal problem. Assessment should be tied to funding of programs designed to alleviate the identified disposal problems.

While such taxes or fees would be most effective at the State or Federal level, adoption of special user fees at the point of sale could be considered. Such a program would require cooperation among the jurisdictions throughout Santa Clara County, since most businesses are located in cities, and would therefore be difficult to implement and administer.

- *Rate structure modifications.* These include various rate structure schemes, from volume to weight dependent collection fees. Fees can be variable, with increasing marginal costs charged for increasing refuse levels, or straight line increases.
- *CDBG Grants.* Grants could be issued under the Economic Development Allocation of the Community Development Block Grant Program (CDBG). Monies may be loaned by the local government to businesses to fund specific projects, such as recycling programs or businesses that use or manufacture products made from recyclable materials.
- *CDC and CIWMB Grants.* Grants may be available from the California Department of Conservation (CDC), Division of Recycling, and from the California Integrated Waste Management Board (CIWMB). The California Department of Commerce, Office of Competitive Technology may fund technological projects that show promise for commercialization.
- *Market Development Zones.* An economic development program could identify, create, support, and promote local/regional recycling programs. This economic development program could include the

creation of market development zones for secondary materials. Industries that utilize post consumer materials would be encouraged to operate within the County of Santa Clara. This program could be implemented in cooperation with other jurisdictions and include the participation of private sector organizations such as Chambers of Commerce, local manufacturing and food processing associations, agricultural agencies, farm bureaus, Private Industry Council, public sector economic development agencies, and the California Integrated Waste Management Board.

### **Potential Funding Sources Identified by the League of California Cities**

The following potential funding sources could be evaluated if needed to fund projects to meet AB 939 requirements.

- Federally tax-exempt facilities
- Mello-Roos community facilities districts
- Current revenue capital financing
- Public enterprise revenue bonds
- General obligation bonds
- Certificates of participation
- Tipping fee increases
- Bank loans
- Financial leasing
- Leveraged leasing
- FHA industrial development grants
- Small Business Administration loans
- EPA solid waste disposal research grants
- EPA solid waste management assistance grants
- FHA technical assistance and training grants
- FHA grants and loans for rural communities
- California Beverage Container recycling and Litter Reduction Program
- California Integrated Waste Management Board Loan Guarantee Program
- Employee Training Programs

Potential funding sources would be evaluated with respect to the project and the level of need, to determine which sources are appropriate for the project under consideration.

**Table 8-1  
Annual Costs of Selected Solid Waste Programs 1991-1995**

Program	Total Annual Capital and Operating Costs	Annual Costs to the Town
• Source Reduction	\$0-5,000	\$0-5,000
• Recycling	\$150,000	\$2,000
• Composting	\$30-50,000	\$0-20,000
• Public Education	\$6,500	\$4,000
• Special Waste	\$12,500	\$2,500-17,500
<b>Total:</b>	<b>\$199,000-\$234,000</b>	<b>\$8,500-\$48,500</b>

# **PROGRAM INTEGRATION**

## **Introduction**

In order to achieve the diversion requirements mandated by AB 939, it is important for Los Altos Hills to integrate its source reduction, recycling, composting, and special wastes programs. AB 939 defines a waste management hierarchy of (1) source reduction, (2) recycling and composting, and (3) environmentally safe transformation and disposal. The integration plan for Los Altos Hills follows this hierarchy.

This component describes the solid waste management practices that promote integrated waste management in the Town of Los Altos Hills. This component also summarizes how the 25 percent and 50 percent diversion mandates will be achieved through an integrated system.

## **Integrated Solid Waste Management Practices**

The solid waste management practices described in the source reduction, recycling, composting, and special wastes components of this document are designed to comply with the integrated waste management hierarchy established by AB 939. In order to be consistent with this hierarchy, Los Altos Hills will continue to attempt to reduce the amount of waste being generated in the Town. Los Altos Hills will continue to provide and expand programs that recycle and compost generated wastes. Finally, wastes that continue to come from the Town that cannot be reduced, recycled, or composted, will be disposed of in the most environmentally sound manner possible. Tables 9-1 summarizes the activities and practices designed to achieve solid waste reduction.

## **Component Integration**

The various components of this element have been integrated so that the selected programs from each component achieve their maximum potential, and so that the overall solid waste program is the best one possible for Los Altos Hills.

In some cases, programs that might have been viable independently were not included in the overall waste management program, because they would not have functioned well with other selected programs. Conversely, some programs that might have been rejected individually were included in the overall program, because they will complement other portions of the integrated solid waste management plan for Los Altos Hills.

Public Education will be a key component of any integrated waste management plan. The effectiveness, efficiency, and accuracy of information disseminated

to the public will greatly influence the overall functioning of Los Altos Hills' solid waste program.

## **Compliance with Diversion Programs**

Los Altos Hills currently diverts approximately 28 percent of the solid waste generated in the Town. The source reduction, recycling, composting, and special waste activities and programs currently in operation or targeted for implementation in Los Altos Hills are designed to achieve the diversion rates mandated in AB 939. Los Altos Hills is already obtaining the 25 percent diversion rate mandated for 1995. In the short-term, Los Altos hills plans to divert 35.5% of the waste stream and by the year 2000 the Town plans to divert 50.7% of the waste stream. With increased efforts, and improved programs, the Town will be able to reach the 50 percent diversion level by 2000. Table 9-1 delineates short- and medium-term programs

## **Program Component Priorities**

In defining the Town of Los Altos Hills' solid waste management program as delineated in this SRRE, priorities have been set between components and specific options for cases with various diversion options. Prioritizing between the specific components and programs or activities for each target material was based on several considerations, which included:

- Position of the activity or program in the integrated waste management hierarchy.
- Effectiveness in reducing the volume, weight, or environmental hazard of targeted wastes.
- Consistency with existing waste management practices.
- Financial feasibility of a proposed option.
- Feasibility and ease of implementation for a given program.

Based on these considerations, components of Los Altos Hills' SRRE were prioritized to achieve the mandated diversion goals, and an overall solid waste management program was selected.

**Source Reduction:** Source reduction is the first step in a hierarchy of approaches to integrated waste management. California State Assembly Bill 939 reflects this by placing source reduction at the top of the integrated waste management hierarchy. Unlike recycling, composting, transformation, and disposal, source reduction is a preventative measure. The Town estimated diversion through source reduction programs for the short and medium term is 1 percent diversion.

**Variable Rate Structure:** the Town has adopted a variable rate structure. Inverted rates consist of a per can rate resulting in higher costs to customers as more cans are used.

**Public Information:** The Town will continue to provide public education efforts through the Town *NEWSLETTER* and garbage bill inserts. The Town will encourage product re-use as well as backyard (on-site) composting.

**Recycling:** The next priority for managing solid waste diversion efforts will be to recycle certain items in an effective and efficient manner. Materials targeted for recycling were based on ease of recovery; cost-effectiveness in collection; existence of markets; and level of contribution to diversion goals. The Town expects to divert an approximate 18% of the waste stream by the short term planning period and between 31-32% of the waste stream by the medium term planning period.

**Residential:** Residential recycling will be expanded from the existing program if deemed feasible. Curbed collection service may be expanded to include additional items as markets become available.

**Industrial:** The Town plans to implement programs to divert inert materials and construction/demolition debris from construction projects.

**Composting:** The Town currently operates in conjunction with Los Altos Garbage Company a drop-off site for yard waste. The drop-off program has proven to be effective in diverting a significant portion of the waste stream. By the end of the short-term planning period the Town estimates a total diversion rate of 17 percent and by 2000 the estimated diversion rate of 19.5%. The Town will explore the option of curbside collection of yard waste as well as study other composting options.

**Special Waste:** The Town plans to continue to provide environmentally safe management or disposal options for special waste that cannot be recycled. The Town will continue to promote and encourage the recycling of special waste where feasible.

## **Integrated Schedule**

Most of the programs targeted for obtaining AB 939 solid waste diversion goals are already in place in Los Altos Hills. Programs that have not yet been initiated will be implemented at various points over the next nine years. In addition, changes to currently functioning programs will be made throughout the short and medium-term planning periods. A summary of implementation timelines by program component is presented in Table 9-1. In all cases, the Department of Public Works will oversee the solid waste management program, and will be responsible for making changes or initiating new programs when the need arises. The Town's franchised waste hauler, Los Altos Garbage Company will assist the Town in implementing the outlined programs where appropriate.

**Table 9-1**  
**SRRE Component Integration**

Town = Town of Los Altos Hills Public Works Department  
LAGCo = Los Altos Garbage Company  
County = Santa Clara County

**Source Reduction Programs**

Task	Responsible Agency	Implementation Date
<b><u>Short-Term</u></b>		
Continue backyard composting program	Town	already in affect
Continue public education program	Town/LAGCo	already in affect
Continue multi-jurisdictional reduction approaches	Town/County	already in affect
Review possibilities for technical assistance	Town	ongoing
Continue variable rate charging scheme	Town/LAGCo	already in affect
Review award possibilities	Town/LAGCo	ongoing
Review grant options	Town/LAGCo	ongoing
<b><u>Medium-Term</u></b>		
Review program for land use regulations	Town	present-1999
Examine possible product bans	Town	1996-2000
Monitor and support state reduction efforts	Town/LAGCo	present-2000
Monitor and support national reduction efforts	Town/LAGCo	present-2000

PROGRAM FUNDING: Program costs are estimated between \$0-5,000. Programs will be funded through the Solid Waste Fund.

**Table 9-1 (continued)**  
**SRRE Component Integration**

Town = Town of Los Altos Hills Public Works Department  
LAGCo = Los Altos Garbage Company  
County = Santa Clara County

**Recycling Component**

Task	Responsible Agency	Implementation Date
<b><u>Short-Term</u></b>		
Canside collection	Town/LAGCo	Already implemented
Expand materials collected	Town/LAGCo	July 1993
Review Program to divert inerts	Town/LAGCo	December 1994
Review regulations	Town/LAGCo	Ongoing review
Review Market development options	Town/LAGCo	Ongoing
Review Rates	Town/LAGCo	Every year
<b><u>Medium-Term</u></b>		
Inert recovery program with user incentives	Town/LAGCo	October 1996
Expand materials collected in canside program	Town/LAGCo	January 1996
Continue short-term programs	Town/LAGCo	Ongoing

**PROGRAM FUNDING:** Funding for expanded residential programs will be through residential collection rates. Funding for debris box (inert recovery) programs will be through user fees applied to the appropriate parties.

**Table 9-1 (continued)**

**SRRE Component Integration**

Town = Town of Los Altos Hills Public Works Department

LAGCo = Los Altos Garbage Company

**Composting Component**

Task	Responsible Agency	Implementation Date
<b><u>Short-term</u></b>		
Continue residential yard waste drop off program	Town/LAGCo	ongoing
Educate residents of the program	Town/LAGCo	ongoing
Educate residents of market for end-products	Town/LAGCo	ongoing
Evaluate the possibility for curb or canside collection of yard waste	Town/LAGCo	Fall 1994 - 1995
Examine possibility of developing a regional compost processing facility	Town/County	ongoing
Study sewage sludge composting	Town/LAGCo	ongoing
<b><u>Medium-term</u></b>		
Continue residential yard waste drop off program	Town/LAGCo	ongoing
If curb or canside yard waste collection proves efficient pursue program	Town/LAGCo	Spring 1996
Divert self-haul yard waste to composting facility	Town	1997
If feasible, study food processing waste collection	Town	1997
If feasible, study co-composting yard waste with other organics	Town	1997

**PROGRAM FUNDING:** Programs will be funded through the Solid Waste Fund and user fees.

**Table 9-1 (continued)**  
**SRRE Component Integration**

Town = Town of Los Altos Hills Public Works Department  
 LAGCo = Los Altos Garbage Company  
 County = Santa Clara County

**Special Waste Component**

Task	Responsible Agency	Implementation Date
<b><u>Short-term</u></b>		
Continue pick-up days for and subsequent recycling of white goods	Town/LAGCo	ongoing
Continue program for dead animal collection and rendering	Town/County	ongoing
Examine and if feasible support regional tire recycling efforts	County/Town	1992-1995
Continue program to prohibit disposal of tires in landfills	Town/LAGCo	ongoing
Examine and if feasible support regional tire recycling	County/Town	ongoing
Examine, and if feasible support inter jurisdictional sewage sludge reuse, or composting programs	County/Town	1992-1995
Dispose of non-recyclable special waste safely	County/Town/LAGCo	ongoing

**PROGRAM FUNDING:** Funding is provided through the Solid Waste Fund for white goods collection and recycling, regional tire recycling efforts and disposal of non-recyclable special waste. Dead animal rendering is funded through the General Fund.

**Table 9-1 (continued)**  
**SRRE Component Integration**

Town = Town of Los Altos Hills Public Works Department  
LAGCo = Los Altos Garbage Company  
County = Santa Clara County

**Public Education and Information Component**

Task	Responsible Agency	Implementation Date
------	--------------------	---------------------

**Short-Term**

Expand general information about solid waste issues	Town/LAGCo	ongoing
Provide feedback on progress of waste reduction programs	Town	ongoing
Assist with educational materials for schools	Town/LAGCo	ongoing
Educate residents about "Closing the Loop"	Town/LAGCo	ongoing
Develop materials for self-haulers and debris box customers for yard-waste and construction materials reduction	Town/LAGCo	Sept. 1994
Expand information accompanying residential clean-ups	Town/LAGCo	ongoing
Develop and expand information on backyard composting programs	Town	Sept 1993
Publish directory of repair businesses	Town	Sept 1994
Enhance materials for curbside recycling programs	Town/LAGCo	ongoing
Publish directory of brokers/end-users of recycled materials	Town	Sept 1994
Develop information that explains enforcement and protection	Town/LAGCo	Jan 1993
Enhance materials for proper disposal of special waste	Town/LAGCo	ongoing
Expand HHW program information	Town/County	ongoing

**Table 9-1 (continued)**  
**SRRE Component Integration**

Town = Town of Los Altos Hills Public Works Department  
LAGCo = Los Altos Garbage Company  
County = Santa Clara County

**Public Education and Information**

Task	Responsible Agency	Implementation Date
------	--------------------	---------------------

---

**Medium-Term**

Develop information about the materials recovery facility	Town	March 1996
Develop materials to support self-haul programs	Town/County	Sept 1996



Report 1301

Final

**DISPOSED WASTE CHARACTERIZATION STUDY  
FOR  
TOWN OF LOS ALTOS HILLS**

Submitted to:

Santa Clara County

by:

CalRecovery Inc.  
725C Alfred Nobel Drive  
Hercules, California 94547

September 1991

Printed on Recycled Paper



**TABLE OF CONTENTS**

**List of Tables** i

**List of Figures** ii

**INTRODUCTION** 1

**CURRENT SOLID WASTE DISPOSAL PRACTICES** 1

**SAMPLING METHODOLOGY OF SOLID WASTE COLLECTION VEHICLES** 3

    ACCURACY STATEMENT ..... 4

    NUMBER OF VEHICLES SAMPLED ..... 5

**SAMPLING METHODOLOGY FOR SELF-HAUL WASTE** 7

**RESULTS** 8

    RESIDENTIAL WASTES ..... 10

    COMMERCIAL WASTES ..... 10

    INDUSTRIAL WASTES ..... 10

    SELF-HAUL WASTES ..... 12

**SEASONALITY** 12

**PROJECTED DISPOSED WASTE QUANTITIES** 13

**APPENDIX A: TEST PLAN**

**APPENDIX B: ASTM SAMPLING METHOD**

LIST OF TABLES

TABLE NUMBER & TITLE

PAGE NUMBER

1.	PLANNED AND ACTUAL NUMBER OF VEHICLES SAMPLED FOR THE NORTH SANTA CLARA COUNTY DISPOSED WASTE FIELD ANALYSIS	6
2.	AVERAGE COMPOSITION AND ANNUAL QUANTITIES OF DISPOSED WASTE	9
3.	PROJECTED ANNUAL QUANTITIES OF DISPOSED WASTE FOR LOS ALTOS HILLS	14

LIST OF FIGURES

<u>FIGURE NUMBER &amp; TITLE</u>	<u>PAGE NUMBER</u>
1A. TYPICAL DISPOSAL PATTERN FOR NORTH SANTA CLARA COUNTY	2
1B. STUDY PERIOD DISPOSAL PATTERN FOR NORTH SANTA CLARA COUNTY	2
2. PERCENTAGE OF TOTAL DISPOSED QUANTITIES BY WASTE SOURCE	11



## DISPOSED WASTE CHARACTERIZATION STUDY

### INTRODUCTION

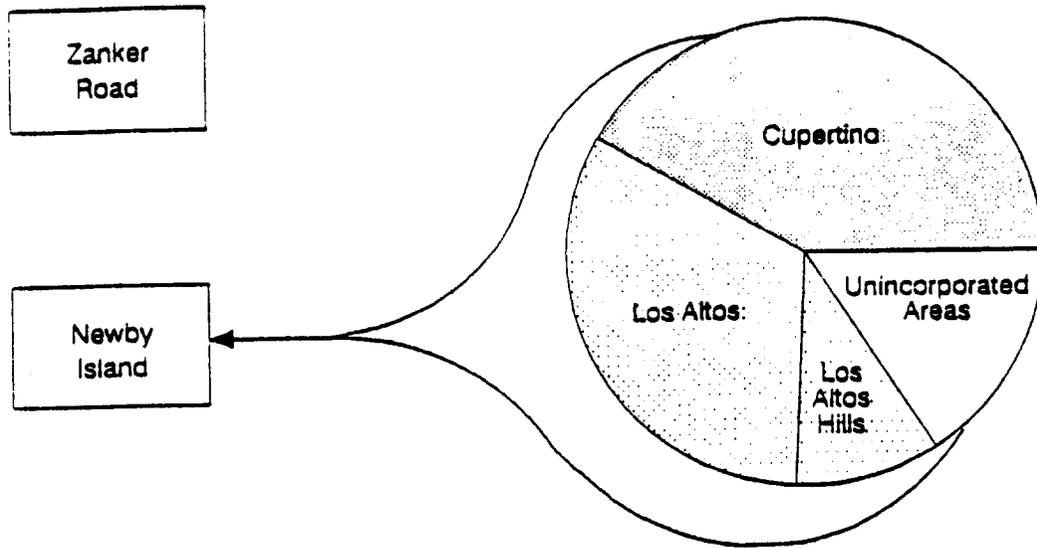
The California Integrated Waste Management Act, Assembly Bill 939, requires local governments to reduce, reuse, recycle, and compost a portion of the materials that are typically disposed by their jurisdictions. The State has mandated that 25% and 50% solid waste diversion rates be met in 1995 and 2000, respectively. The information presented in this study defines the existing conditions regarding disposed waste quantities. The results of the study establish the baseline data for future integrated waste management practices. The data presented herein will be used along with diversion data collected in other studies to compute waste generation. The baseline waste generation data will be used subsequently to assist in the monitoring and documentation of the progress of programs implemented to achieve the mandated 25% and 50% diversion goals.

CalRecovery was retained by Santa Clara County to plan and conduct a waste characterization study for portions of north Santa Clara County (North County). The North County area defined for this study is composed of the following jurisdictions: 1) City of Los Altos; 2) Town of Los Altos Hills; 3) City of Cupertino; and 4) unincorporated north Santa Clara County. For purposes of this report, unincorporated north Santa Clara County comprises the unincorporated areas within the sphere of influence of each of the jurisdictions.

The estimated annual and projected disposed waste data presented in this study were determined based on the average compositions of the sampled waste sources developed for this study, the apportionment of scalehouse data to respective waste types, and population data supplied by the jurisdictions and from published sources.

### CURRENT SOLID WASTE DISPOSAL PRACTICES

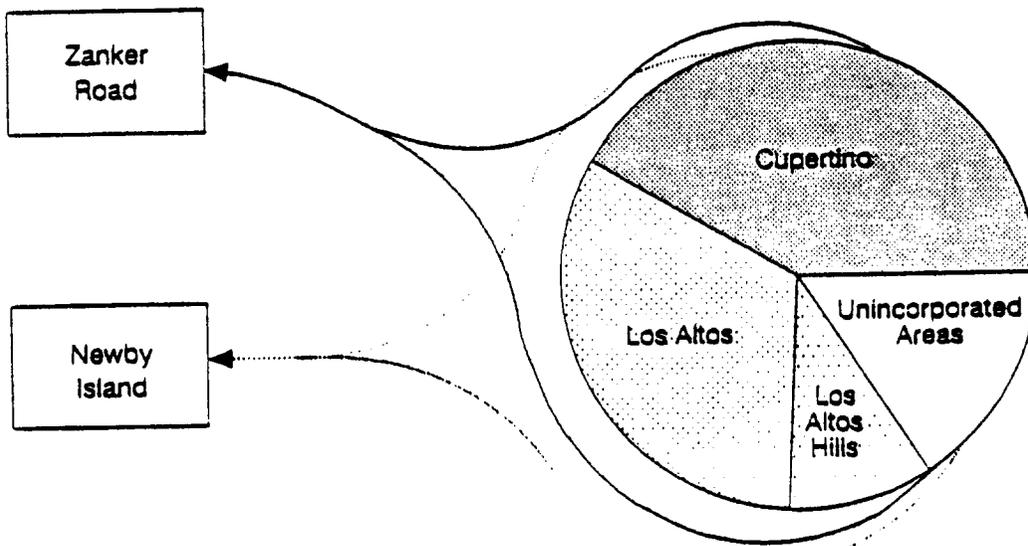
The cities of Cupertino and Los Altos, and the Town of Los Altos Hills have recently agreed to long-term (30-year) disposal contracts with BFI for disposal at Newby Island Landfill (see Figure 1a). Each of the disposal agreements provides for disposal of wastes generated within the



— All collection vehicles

Note: Jurisdiction sizes are relative to percent of total waste disposed.

Figure 1a. Typical Disposal Pattern for North Santa Clara County



— All collection vehicles for sampling

— All nonsampled collection vehicles

Note: Jurisdiction sizes are relative to percent of total waste disposed.

Figure 1b. Study Period Disposal Pattern for North Santa Clara County

sphere-of-influence of each city, which includes the unincorporated area in and adjacent to the city. The County is a party to each agreement. The four jurisdictions have also executed an agreement allocating the contracted capacity among the jurisdictions.

## **SAMPLING METHODOLOGY FOR SOLID WASTE COLLECTION VEHICLES**

A Test Plan which outlines the field and sorting activities for the jurisdictions and lists the disposed waste components for sorting is included as Appendix A. The California Integrated Waste Management Board (CIWMB) has developed the list of waste categories and types that are used in this report, to reflect the common practices of solid waste management and recycling industries in California and provide recognizable names for waste types requiring special handling and/or disposal. The state-wide uniform application of the list of waste categories and types will allow the CIWMB to compare the appropriateness of a jurisdiction's chosen diversion methods with the quantities and types of waste currently disposed.

The following CIWMB definitions are used when referring to residential, commercial, and industrial wastes. A brief description as to how these wastes were typically received for sampling follow each definition respectively.

- **Residential Waste:** Solid waste originating from single-family or multi-family dwellings (apartments). Single-family residential waste arrived for sampling in side-loading vehicles. Apartment waste was received in front-loading and side-loading vehicles.
- **Commercial Waste:** Solid waste originating from stores; business offices; commercial warehouses; hospitals; educational, health care, military, and correctional institutions; non-profit research organizations; and government offices. The majority of commercial waste was received for sampling in front-loading vehicles.
- **Industrial Waste:** Solid waste originating from mechanical manufacturing facilities, factories, refineries, construction and demolition projects, and publicly-operated treatment works and/or solid waste placed in debris boxes. All industrial waste was sampled from debris boxes.

The characterization of disposed waste from solid waste collection vehicles was conducted from June 3 to 12, 1991, at the Zanker Road Landfill and Recycling Center. Assistance in the study was provided by Los Altos Garbage Company (LAGCO). Initial discussions with LAGCO prior to sampling provided background information regarding jurisdictional boundaries, hauler routes, and frequency of collection of solid waste. To facilitate the sampling and sorting procedure, LAGCO routed solid waste collection vehicles which generally go to Newby Island directly to the Zanker Road facility (Figure 1b).

The Draft ASTM "Method for the Determination of the Composition of Unprocessed Municipal Solid Waste," which describes the testing, analytical, and statistical method for sampling, is included as Appendix B. Based on the LAGCO background data, daily residential, commercial, and industrial waste sources could be readily sampled on an as-needed basis during the sampling period to reflect the jurisdiction's waste stream. The as-needed procedure for selection of vehicle loads provided an unbiased method of selection and therefore is random because the investigator has no basis (other than the need to sort) upon which to subjectively select one vehicle over another.

Zanker Road assisted in transporting sample loads to the sampling area and sorting the designated samples. This work and all data recording were supervised and documented throughout the sampling period by CalRecovery field personnel.

\*Please note: further explanation of how "as needed" sampling was unbiased is provided on page 15 as an addendum.

### ACCURACY STATEMENT

The sampling program for disposed waste analysis was designed to achieve composition results that would be within  $\pm 10\%$  to  $15\%$  of the population mean ( $\bar{x}$ ) of each jurisdiction's composite disposed waste sources at the 90% level of confidence for the majority of waste categories (see Test Plan in Appendix A). The jurisdiction's composite disposed waste stream is defined as the sum of its waste from residential, commercial, and industrial sources. Because jurisdiction-specific composition data were not available at the time of this study, the Test Plan assumes a coefficient of variation of 0.3 ( $s/\bar{x}$ ) among the majority of waste categories. The selection of the 0.3 value for coefficient of variation is based on the average and standard deviations of component compositions (in particular but not exclusively, the total paper category as noted below) measured in previous waste characterizations in California after 1984. For example, the residential and commercial total paper average compositions ( $\bar{x}$ ) and standard deviations ( $s$ ), as determined in the October 1990 waste characterization study for the City

of Sunnyvale<sup>1</sup> (located in north Santa Clara County) waste characterization study, yield a coefficient of variation of approximately 0.3. Substituting this value would produce sample sizes similar to those developed with the Test Plan coefficient of variation.

Using the ASTM Draft "Method for Determination of the Composition of Unprocessed Municipal Solid Waste," the appropriate number of samples (n) required to achieve an accuracy within 15% of the population mean is computed by invoking the relation for accuracy (e) as a fraction and the number of samples (n):

$$n = \left[ \frac{t^* (s/x)}{e} \right]^2$$

where  $t^*$  is the t-statistic and  $s/x$  is the coefficient of variation. Through substitution:

$$n = \left[ \frac{1.684 (0.3)}{0.15} \right]^2$$

$$n \approx 12$$

using  $t^*_{90}$  (n=12) through substitution:

$$n = \left[ \frac{1.7959 (0.3)}{0.15} \right]^2$$

$$n \approx 13$$

Under these conditions, the minimum number of samples that should be collected for each jurisdiction is 13. The actual number of samples analyzed in the field for each jurisdiction was in the range of 13 to 25.

## NUMBER OF VEHICLES SAMPLED

The proposed and the actual total number of solid waste collection vehicles sampled for each jurisdiction for the disposed waste analysis are presented in Table 1. The table also shows the number of vehicles sampled by waste type.

<sup>1</sup> "Source Reduction and Recycling Element," prepared by Cal Recovery Systems, Inc. for the City of Sunnyvale, 1990.

Table 1. Planned and Actual Number of Vehicles Sampled for the North Santa Clara County Disposed Waste Field Analysis (June 3 - 12, 1991)

Waste Source	Cupertino		Los Altos		Los Altos Hills		Unincorporated		Total	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
Residential	10	10	10	9	10	7	10	10	40	36
Commercial	8	8	8	8	-	-	-	-	16	16
Industrial	6	7	6	8	6	6	6	7	24	28
<b>TOTALS</b>	<b>24</b>	<b>25</b>	<b>24</b>	<b>25</b>	<b>16</b>	<b>13</b>	<b>16</b>	<b>17</b>	<b>80</b>	<b>80</b>

## SAMPLING METHODOLOGY FOR SELF-HAUL WASTE

The primary sources of self-haul waste are residents of single-family dwellings and small business operators. It is advantageous, for planning purposes, to make the distinction between compacted residential and commercial waste, and noncompacted self-haul waste. Programs selected for implementation to meet the required 25% and 50% diversion goals can be better determined if self-haul waste is addressed as a separate waste source.

A visual survey to develop average compositions of this waste stream was conducted during the week of June 3, 1991, at the Mt. View Landfill. The Mt. View Landfill was chosen as the location for the self-haul waste characterization because of its proximity to the North County jurisdictions. Because the number of self-haul loads disposed at the site was low, an informal telephone survey of businesses that generate the type of waste that is often disposed by self-haul vehicles (e.g., landscapers, gardeners, general contractors) was conducted to assess typical disposal patterns. The responses indicated that these businesses dispose of the waste via self-haul to various disposal sites in the area, as well as have it collected and disposed in roll-off containers or by commercial vehicles. Additional composition data on self-haul wastes from the North County jurisdictions were also obtained from a visual survey conducted by CalRecovery at the Guadalupe Mines Landfill during July 1991.

Self-haul waste was classified into one of four categories: yard waste, construction/demolition debris, dirt/rubble, or miscellaneous (household refuse). For example, if a load was estimated by visual observation to contain a majority of yard waste, it was designated as a yard waste load. This information was then used to calculate an average yard waste load composition. Since self-haul waste is typically bulky and relatively uniform, trained field observers are able to analyze and record a large number of vehicle loads.

The four categories identified in the self-haul waste characterization can be described as the following:

- **Yard waste:** loads typically consisting of residential yard clean-up and maintenance debris
- **Construction/demolition:** loads resulting from construction, repairs, remodeling, and demolition projects
- **Dirt/rubble:** loads consisting of debris-filled dirt and, on occasion, clean dirt for use as landfill cover

- **Miscellaneous:** loads which cannot be classified into one of the categories listed above and often contain large percentages of solid waste from residents who do not receive curbside or regular collection service

The yard waste, construction/demolition, and dirt/rubble categories generally contain small percentages of residential and/or commercial type waste. While most self-haul waste can be readily categorized into one of the four above categories, purely homogeneous self-haul waste loads are generally quite rare.

Concurrent with the visual sampling, scalehouse personnel at the Mt. View Landfill recorded the origin (jurisdiction) of self-haul loads during the sampling period. Similar information was obtained from the field study conducted at Guadalupe Mines Landfill, and from a two-day scalehouse survey conducted by BFI at Newby Island. This information provided the means for apportionment of quantity data to each jurisdiction.

CalRecovery contacted the following sources to obtain self-haul quantity data: Mt. View Landfill, Zanker Road Landfill and Recycling Center, Browning-Ferris Industries (Newby Island Landfill), and Guadalupe Mines Landfill. Data received from Zanker and BFI showed that quantities of self-haul wastes from the North County jurisdictions were negligible.

Over 725 self-haul vehicles were visually surveyed at the Mt. View and Guadalupe landfills for volume, waste type, and composition.

\*Please note: A further discussion of self-haul vehicles sampled to include;

- 1) the number of vehicles sampled and businesses surveyed
- 2) the jurisdiction of origin of the vehicles sampled and
- 3) how the number of vehicles sampled or businesses sampled provided representative composition and quantity data for the Town of Los Altos Hills

**RESULTS** This information is provided as an addendum on pages; 16, 17 and 18.

The average compositions (% weight) and the estimated annual disposed quantities (in tons/year) for residential, commercial, industrial, and self-haul waste are shown in Table 2. The results are presented in accordance with the categories required by the California Integrated Waste Management Board.

For this study the category labeled "Other Special Wastes" consists of common household appliances such as stereos, radios, and telephones. These types of appliances predominate in compacted residential waste (i.e., waste usually collected in rear loaders) and can be readily salvaged or identified from the tipping area.

Table 2. Average Composition (% Weight) and Annual Quantities (Tons/Year) of Disposed Waste.

Los Altos Hills  
July 18-25, 1991  
Disposed Waste Characterization

Material	Waste Source								Total Disposed	
	Residential N = 7		Commercial		Industrial N = 6		Self Haul (Visual)			
	%	TPY	%	TPY	%	TPY	%	TPY	%	TPY
1) TOTAL PAPER	45.2	1350			2.2	109	7.8	3	18.1	1482
OCC/Kraft	5.8	197			1.3	67	3.7	1	3.3	265
Mixed	24.5	731			0.5	25	3.3	1	9.4	758
Newspaper	4.9	148			0.0	0	0.4	0	1.8	148
High-Grade	0.6	18			0.0	0	0.0	0	0.2	18
Other	8.7	259			0.3	17	0.1	0	3.4	278
2) TOTAL PLASTICS	9.0	269			3.0	151	3.0	1	5.2	421
HDPE	1.1	33			0.2	8	0.0	0	0.5	42
PET	0.2	7			0.0	0	0.0	0	0.1	7
Film	4.0	119			0.0	0	1.2	0	1.5	120
Other	3.8	109			2.8	143	1.7	1	3.1	253
3) TOTAL GLASS	3.1	92			1.0	50	0.6	0	1.8	143
Refillable Beverage	0.0	1			0.0	0	0.0	0	0.0	1
Cal Redemption	0.7	20			0.2	8	0.1	0	0.4	29
Other Recyclable	2.0	61			0.5	25	0.1	0	1.1	88
Other Non-Recycl	0.3	10			0.3	17	0.5	0	0.3	27
4) TOTAL METALS	5.5	165			8.7	437	13.3	5	7.5	607
Aluminum Cans	0.2	6			0.0	0	0.1	0	0.1	8
Bimetal	0.0	0			0.0	0	0.0	0	0.0	0
Tin F/B	1.4	43			0.0	0	0.0	0	0.5	43
Non-Fe	0.2	5			1.3	67	0.7	0	0.9	73
White Goods	0.0	0			2.5	126	4.2	1	1.8	128
Other	3.7	110			4.8	244	8.3	3	4.4	357
5) YARD WASTE	11.4	342			14.2	715	5.1	2	13.1	1058
6) OTHER ORGANICS	23.4	700			61.8	3121	28.5	10	47.5	3832
Food	13.8	407			0.0	0	0.4	0	5.0	407
Tires/Rubber	0.9	27			2.8	143	0.5	0	2.1	171
Wood	2.1	62			36.3	1834	20.2	7	23.8	1903
Ag. Crop Residue	0.0	0			0.0	0	0.0	0	0.0	0
Manure	0.0	0			0.0	0	0.0	0	0.0	0
Textile/Leather	2.5	35			0.8	42	5.1	2	1.8	129
Other Misc Org.	4.0	119			21.8	1102	1.4	0	15.1	1222
7) OTHER WASTES	2.2	64			9.2	463	41.5	15	6.7	542
Inerts	2.1	32			9.2	463	41.4	14	6.7	539
H/W	0.1	2			0.0	0	0.1	0	0.0	2
8) SPECIAL WASTES a)	0.2	5			0.0	0	0.4	0	0.1	6
Total	100.0	2988			100.0	5048	100.0	35	100.0	3071

Average may not sum to 100% due to rounding

a) Small Household Appliances

b) Due to the small percentage of disposed commercial waste (less than 2% of the total), the residential totals include 142 TPY reported as commercial wastes by the hauler. Residential and commercial waste are collected in the same vehicles.

Figure 2 shows the percentage (by weight) of the jurisdiction's total disposed waste by waste source. As shown in the figure, industrial wastes comprise almost 2/3 of the total disposed waste stream (63%). Residential wastes comprise approximately 1/3 (35%), and the percentages of commercial wastes (2%) and self-haul wastes (<1%) in the total disposed waste stream are small.

In the following sections, the results of the disposed waste characterization are discussed as they pertain to the Town of Los Altos Hills.

### **RESIDENTIAL WASTES**

Vehicles containing residential waste were sampled each day during the collection vehicle sample period. As shown in Table 2, the total paper category is the category with the largest concentration (45.2%) in the disposed residential waste stream. Mixed paper alone comprises approximately 24.5% of the Town's disposed residential waste. Food waste comprises 13.6%, and yard waste 11.4% of this waste stream.

### **COMMERCIAL WASTES**

Commercial waste was not identified during the waste sort because no discrete commercial loads were available for sampling. Based on data received from LAGCO, commercial waste in Los Altos Hills represents less than 2% of the jurisdiction's total disposed waste stream. These quantities have been presented with the residential waste stream in this report because the wastes are collected in the same vehicles.

### **INDUSTRIAL WASTES**

While there are no industrial generators located within the Town, by CIWMB definition, industrial waste includes material placed into debris boxes. Therefore, the industrial composition shown in Table 2 is based on debris boxes. Table 2 shows that 61.8% of the disposed industrial waste stream is other organics; 36.3% is wood wastes. A significant portion of the disposed industrial waste stream is yard waste (14.2%). A number of landscape contractors reported that they routinely place yard waste into debris boxes.

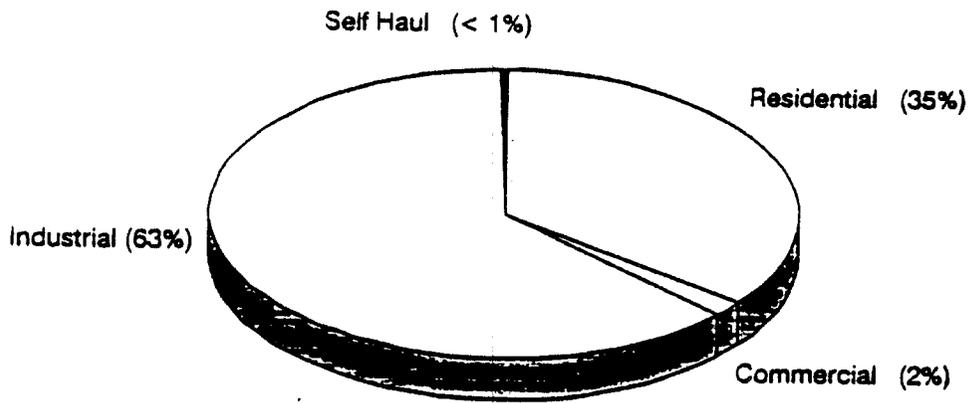


Figure 2.  
Percentage (by weight) of  
Total Disposed Quantities by Waste Source -  
Town of Los Altos Hills

## SELF-HAUL WASTES

The quantity of self-haul wastes disposed is less than 1% of the total disposed solid waste stream.

As shown in Table 2, the inerts waste type has the largest concentration (41.4%) in the disposed self-haul wastes. Wood waste comprises 20.2% of this waste stream.

## SEASONALITY

It has been assumed that four seasons could potentially impact the disposed wastes in the Town of Los Altos Hills. The collection vehicle quantities supplied for the sampling period were representative of 6 months of disposed waste data and were doubled to provide estimated quantities on a 12-month basis.

The potential seasonal impacts on the remainder of Los Altos Hill's waste stream were considered based on the following factors: demographics of the area, degree of commercial development, local meteorology, the results of the disposed waste characterization, and the results of seasonal waste characterization studies conducted for the City and County of San Francisco (1985/86),<sup>2</sup> the City of Berkeley (1988/89), North Santa Clara County (NSCC) (1982/83),<sup>3</sup> and San Diego County (1988/89).<sup>4</sup> This information was reviewed with emphasis placed upon the prior four-season waste characterization study for North Santa Clara County. Based on the review and on the fact that yard waste is a large percentage of the waste stream, yard waste is judged to be the only component that may undergo a substantial seasonal variation in generation. The concentration of yard waste is expected to fluctuate within  $\pm 20\%$  of the estimated annual average over the course of a year. The results of the four-season NSCC study showed that the concentrations of yard waste in the spring and fall were 21% and 31%, respectively. These amounts are approximately  $\pm 20\%$  of the average of the four seasons' (26%) projected disposed waste quantities.

---

<sup>2</sup> "Solid Waste Characterization Study," study prepared by Cal Recovery Systems, Inc. for the City of San Francisco, 1987.

<sup>3</sup> "North Santa Clara County Comprehensive Waste Characterization Study (1982-83) Final Summary Report," prepared by Cal Recovery Systems, Inc. for the NSCC Solid Waste Management Authority, 1984.

<sup>4</sup> "Waste Characterization and Market Study," prepared for the County of San Diego by Recovery Sciences, Inc., 1989.

## **PROJECTED DISPOSED WASTE QUANTITIES**

Fifteen-year projections of disposed wastes by waste source are shown in Table 3. The projected quantities are based on population projections from the Association of Bay Area Governments (ABAG). The population projections are used only to calculate the escalation rate of the disposed waste quantities.

Table 3 Projected Annual Quantities of Disposed Waste for Los Altos Hills (Tons/Year)

Material	1991		1992		1993		1994		1995		1996		1997		1998		1999		2000		2001		2002		2003		2004		2005		2006		
	1,002	1,002	1,002	1,002	1,002	1,002	1,002	1,002	1,002	1,002	1,006	1,006	1,006	1,006	1,006	1,006	1,006	1,006	1,006	1,006	1,006	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000			
1) TOTAL PAPER	1462	1465	1469	1472	1475	1484	1493	1502	1511	1520	1520	1520	1520	1520	1520	1520	1520	1520	1520	1520	1520	1520	1520	1520	1520	1520	1520	1520	1520	1520	1520		
OCU/Mark	265	266	266	267	268	268	271	273	274	276	276	276	276	276	276	276	276	276	276	276	276	276	276	276	276	276	276	276	276	276	276		
Mixed Paper	758	759	761	763	764	769	773	778	783	788	788	788	788	788	788	788	788	788	788	788	788	788	788	788	788	788	788	788	788	788	788		
Newsprint	146	146	146	147	147	148	148	148	148	148	148	148	148	148	148	148	148	148	148	148	148	148	148	148	148	148	148	148	148	148	148		
High Grade	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18		
Other Paper	276	276	277	277	278	280	281	283	285	287	287	287	287	287	287	287	287	287	287	287	287	287	287	287	287	287	287	287	287	287	287		
2) TOTAL PLASTICS	421	422	423	424	425	428	430	433	435	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438		
HDPE	42	42	42	42	42	42	43	43	43	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44		
PET	7	7	7	7	7	7	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8		
Film	120	120	120	120	121	121	122	123	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	
Other Plastics	253	253	254	254	255	256	258	259	261	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	
3) TOTAL GLASS	143	143	143	144	144	145	146	147	147	148	148	148	148	148	148	148	148	148	148	148	148	148	148	148	148	148	148	148	148	148	148	148	
Bottleable Glass (Bov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Cald (Reclamation Value	29	29	29	29	29	29	29	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
Other Recyclable	86	86	86	87	87	87	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88
Other Non Recyclable	27	27	27	27	27	27	27	27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
4) TOTAL METALS	607	606	609	611	612	616	619	623	627	631	631	631	631	631	631	631	631	631	631	631	631	631	631	631	631	631	631	631	631	631	631	631	
Aluminum Cans	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
Beverage Cans	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Tin/F&B Cans	43	43	43	43	43	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	
NIGHT (Other than Alu	73	73	73	73	74	74	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	
White (Wood	128	128	128	128	129	130	130	131	132	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133
Other Metal	357	358	359	359	360	362	364	367	369	371	371	371	371	371	371	371	371	371	371	371	371	371	371	371	371	371	371	371	371	371	371	371	371
5) YARD WASTES	1059	1061	1063	1066	1068	1074	1081	1087	1094	1101	1101	1101	1101	1101	1101	1101	1101	1101	1101	1101	1101	1101	1101	1101	1101	1101	1101	1101	1101	1101	1101	1101	1101
6) OTHER ORGANICS	3832	3840	3848	3856	3864	3887	3911	3936	3959	3983	3983	3983	3983	3983	3983	3983	3983	3983	3983	3983	3983	3983	3983	3983	3983	3983	3983	3983	3983	3983	3983	3983	3983
Food	407	408	408	409	410	413	415	418	420	423	423	423	423	423	423	423	423	423	423	423	423	423	423	423	423	423	423	423	423	423	423	423	423
Tires/Rubber	171	171	171	172	172	173	174	175	176	177	177	177	177	177	177	177	177	177	177	177	177	177	177	177	177	177	177	177	177	177	177	177	177
Wood	1903	1907	1911	1915	1919	1931	1943	1955	1967	1979	1979	1979	1979	1979	1979	1979	1979	1979	1979	1979	1979	1979	1979	1979	1979	1979	1979	1979	1979	1979	1979	1979	1979
Ag Crop Residue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Manure	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Leathers/Leather	129	129	130	130	130	131	132	133	133	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134
Other Misc. Organics	1222	1224	1227	1228	1232	1240	1247	1255	1262	1270	1270	1270	1270	1270	1270	1270	1270	1270	1270	1270	1270	1270	1270	1270	1270	1270	1270	1270	1270	1270	1270	1270	1270
7) OTHER WASTES	542	543	544	545	546	549	553	556	560	563	563	563	563	563	563	563	563	563	563	563	563	563	563	563	563	563	563	563	563	563	563	563	563
Inert Solids	539	540	542	543	544	547	550	554	557	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561
HWM	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
8) OTHER SPECIAL WASTES b)	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Total	8071	8088	8105	8122	8139	8189	8238	8289	8339	8390	8390	8390	8390	8390	8390	8390	8390	8390	8390	8390	8390	8390	8390	8390	8390	8390	8390	8390	8390	8390	8390	8390	8390

Total may not sum exactly due to rounding  
 a) Escalation factor (Esc factor) is based on projected population data, as reported by AUCG  
 b) Small Miscellaneous Appliances

## Addendum

Based on the hauler's background data, each jurisdiction's daily residential, commercial, and industrial waste sources could be readily sampled on an as-needed basis during the sampling period to reflect each jurisdiction's waste stream. Vehicles were identified by the hauler to represent the different waste sources of the jurisdictions (i.e., residential, commercial, and industrial). Loads were then selected from each jurisdiction and source on an as-needed basis. The as-needed procedure for selection of vehicle loads provides an unbiased method of selection because the investigator has no prior knowledge of the contents or history of the load and no basis (other than the need to sort) upon which to subjectively select one vehicle over another. Therefore, the load is selected by chance.

[For section entitled "Sampling Methodology for Self-Haul Waste"]

The primary sources of self-haul waste are residents of single-family dwellings and small business operators. It is advantageous, for planning purposes, to make the distinction between compacted residential and commercial waste, and noncompacted self-haul waste. Programs selected for implementation to meet the required 25% and 50% diversion goals can be better determined if self-haul waste is addressed as a separate waste source.

A visual survey to develop average compositions of this waste stream was conducted during the week of June 3, 1991, at the Mt. View Landfill. The Mt. View Landfill was chosen as the location for the self-haul waste characterization because of its proximity to the North County jurisdictions. Additional composition data on self-haul wastes from the North County jurisdictions were also obtained from a visual survey conducted by CalRecovery at the Guadalupe Mines Landfill during July 1991. The vehicles surveyed originated in jurisdictions in Santa Clara County.

Self-haul waste was classified into one of four categories: yard waste, construction/demolition debris, dirt/rubble, or miscellaneous (household refuse). For example, if a load was estimated by visual observation to contain a majority of yard waste, it was designated as a yard waste load.

The four categories identified in the self-haul waste characterization can be described as the following:

- **Yard waste:** loads typically consisting of residential yard clean-up and maintenance debris
- **Construction/demolition:** loads resulting from construction, repairs, remodeling, and demolition projects
- **Dirt/rubble:** loads consisting of debris-filled dirt and, on occasion, clean dirt for use as landfill cover
- **Miscellaneous:** loads which cannot be classified into one of the categories listed above and often contain large percentages of solid waste from residents who do not receive curbside or regular collection service.

The yard waste, construction/demolition, and dirt/rubble categories generally contain small percentages of residential and/or commercial type waste. While most self-haul waste can be readily categorized into one of the four above categories, purely homogeneous self-haul wastes loads are generally quite rare. Over 725 self-haul vehicles were visually surveyed at the Mt. View and Guadalupe landfills for volume, waste type, and composition. Since self-haul waste is typically bulky and relatively uniform, trained field observers are able to analyze and record a large number of vehicle loads. The high rate of sampling provided a representative composition of the self-haul waste for the North County jurisdictions, including the Town of Los Altos Hills. The data from each category were then used to calculate an average self-haul composition for each jurisdiction.

CalRecovery contacted the following sources to obtain self-haul quantity data: Mt. View Landfill, Zanker Road Landfill and Recycling Center, Browning-Ferris Industries (Newby Island Landfill), and Guadalupe Mines Landfill. Data received from Zanker and BFI showed that quantities of self-haul wastes from the North County jurisdictions were negligible.

Concurrent with the visual sampling, scalehouse personnel at the Mt. View Landfill recorded the origin (jurisdiction) of self-haul loads during the sampling period. Similar information was obtained from the field study conducted at Guadalupe Mines Landfill, and from a two-day scalehouse survey conducted by BFI at Newby Island. The recorded volumes, by load type, were used to apportion the quantity of self-haul waste to each of the jurisdictions. During the sampling period, less than 1% of the disposed self-haul waste volume was attributed to the Town of Los Altos.

Because the number of self-haul loads disposed during the field sampling study was low, an informal telephone survey of 12 businesses that generate the type of waste that is often disposed by self-haul vehicles (e.g., landscapers, gardeners, general contractors) was conducted. The purpose of the telephone survey was to collect information on disposal practices in order to verify whether or not the disposal patterns identified during the field study were accurate. Over 50% of the businesses providing responses indicated that their waste is collected and disposed in roll-off containers or by commercial vehicles. Other respondents indicated that they dispose of the waste via self-haul to various disposal sites in the area (primarily Guadalupe landfill). Based on this supplementary information, it was determined that the methodology used during the field sampling program was sufficient to adequately characterize and quantify the self-haul waste from the North County jurisdictions.

In summary, composition and quantity data for self-haul waste were developed based on discussions with hauler and landfill personnel, field observations and measurements by CalRecovery, and scalehouse surveys at the landfills. The large number and percentages of self-haul vehicles sampled for origin, waste quantities, and composition provided a firm basis for determining the quantities and composition of the self-haul waste for the North County jurisdictions. Due to the small amount of self-haul waste disposed by the Town of Los Altos Hills, the total number of loads sampled provided a representative composition of the jurisdiction's self-haul waste stream.

**Appendix A**

**SANTA CLARA NORTH COUNTY AREA  
DISPOSED WASTE FIELD ANALYSIS PLAN**

**Prepared by:**

**Cal Recovery Systems, Inc.  
160 Broadway, Suite 200  
Richmond, California 94804**

**Submitted to:**

**County of Santa Clara  
1735 North First Street, Suite 275  
San Jose, California 95112**

**May, 1991**

## **DISPOSED WASTE FIELD ANALYSIS PLAN**

### **INTRODUCTION**

This test plan presents the methodology for estimating the composition of solid waste generated within the City of Cupertino, City of Los Altos, Town of Los Altos Hills, and Unincorporated North County. The field analyses will be conducted at the Zanker Road Disposal Site and the Mountain View Landfill during the period of June 3-12 (Monday through Wednesday), 1991.

### **SAMPLE COLLECTION AND SORTING METHODS**

The methods of sample collection and of sorting will be those adapted from the ASTM Draft "Method for Determination of the Composition of Unprocessed Municipal Solid Waste." Loads of waste will be diverted at the landfill to the load sampling and sorting location. Waste categories and types for the field analyses will be those specified in Section 18722 (j) of the Emergency Regulations. A listing of the waste categories and types is presented, but not limited to, those in Table 1. Data will be recorded on field sample data sheets similar to those in Table 2.

Residential waste collection vehicles will be selected to be representative of waste from within each jurisdiction. Commercial waste collection vehicles will be selected to be representative of commercial generators within each jurisdiction. The selection of representative loads of waste will be based on discussions with the haulers and CRS's knowledge of the residential and commercial waste sources within the jurisdictions.

Industrial waste collection vehicles (debris boxes) from the three jurisdictions will be selected at random at the landfill during the course of the one-week field study.

Special wastes (such as sludge, asbestos, etc.) will be sorted to the extent that it is safe to do so and to the extent that the materials are present in loads designated for sampling. Special wastes may also be identified during the visual survey of self-hauled wastes. Additionally, records kept of special waste by haulers and disposers will be analyzed as part of the study.

No sources of marine waste were identified during the planning process for the field analysis program. However, while conducting the field study, such wastes will be noted if they are observed.

### **WASTE SAMPLING PLAN**

The waste sampling plan for each jurisdiction and waste source is delineated in Table 3. As shown in the table, in addition to the field sorting program for waste delivered to Zanker Road by collection vehicles, self-haul wastes and wastes delivered by small haulers will be visually surveyed at the Mountain View Landfill to establish an estimation of the quantity, composition, and source of this waste including jurisdiction of generation. The objective will be to visually survey about 70 percent of the self-haul wastes disposed during the week sample period.

The sampling plan is structured to achieve the following objectives:

Provide an accurate accounting of waste materials by jurisdiction and waste source (residential, commercial, industrial, and self-haul generators).

- An estimated composition measurement accuracy for the primary recyclable waste categories of the overall waste stream in the range of 10% to 15% of the population mean for each jurisdiction at the 90% confidence level.

Since composition sampling has not been performed before on wastes from all three jurisdictions, the sampling plan is based on information regarding sample variability obtained from other areas. Specifically, the plan has been developed assuming a ratio of standard deviation to mean value (coefficient of variation) of 0.3. The selection of the 0.3 value for coefficient of variation is based on the average and standard deviations of component compositions, in particular but not exclusively, the total paper category measured in previous waste characteristics in California after 1984. An objective of the analysis is to characterize the overall waste stream from each jurisdiction within an accuracy of approximately 10 to 15%. A sampling of 18 to 20 samples per jurisdiction yields an estimated error band of 12% at the 90% confidence level. The number of collection vehicles selected for sampling represents greater than 50% of those available during the sample period.

## **WASTES QUANTITIES**

Total waste quantities will be accounted for by using the most recent 6 months of historical data for each waste type originating from within the three cities. The quantity data for each waste source (resident, commercial, and industrial) will be provided for each jurisdiction by the collection company. Quantities of self-haul wastes will be provided by the solid waste facility operator(s) or computed by CRS based on field data.

## **ANCILLARY DATA COLLECTION**

Ancillary data collection activities before, during and after the field analyses will include where possible the following for each vehicle load:

### **Residential**

- Collection company and route number
- Estimated number of corresponding households

### **Commercial**

- Collection company and route number
- Type of generator

### **Industrial**

- Collection company
- Type of container (open top or compactor)
- Type of generator

Table 1. Refuse Components for Sorting Study

- 1) **TOTAL PAPER**
  - Corrugated containers
  - Mixed paper
  - Newspaper
  - High grade ledger paper
  - Other paper
  
- 2) **TOTAL PLASTICS**
  - HDPE containers
  - PET containers
  - Film plastics
  - Other plastics
  
- 3) **TOTAL GLASS**
  - Refillable beverage
  - California Redemption Value
  - Other recyclable
  - Other non-recyclable
  
- 4) **TOTAL METALS**
  - Aluminum cans
  - Bi-metal cans
  - Tin F&B cans
  - Non-ferrous/other aluminum
  - White goods
  
- 5) **YARD WASTES**
  
- 6) **OTHER ORGANICS**
  - Food waste
  - Tires/rubber products
  - Wood wastes
  - Agricultural crop residues
  - Manure
  - Textiles/leather
  - Other organics
  
- 7) **OTHER WASTES**
  - Inert solids
  - HHW
  
- 8) **OTHER SPECIAL WASTES**



**Table 3. Santa Clara North County Sampling Plan**

Waste Source	Los Altos	Los Altos Hills	Cupertino	Unincorporated	Totals <sup>1</sup>	Self-Haul
Residential	10	10	10	10	40	(Visual)
Commercial	8	-	8	5	21	(Visual)
Industrial	6	6	6	6	24	(Visual)
<b>Totals</b>	<b>24</b>	<b>16</b>	<b>24</b>	<b>21</b>	<b>85</b>	

<sup>1</sup>The actual number of samples to be collected and sorted depends upon the actual arrival times of vehicles at the landfill. The total number of samples to be collected is estimated to be in the range of 80 to 90.

## Appendix B

ASTM Designation: DXXXX-XX

Draft Number 4: 1/24/90  
D34.01.02 Waste Sampling  
Author: G. Savage

### METHOD FOR DETERMINATION OF THE COMPOSITION OF UNPROCESSED MUNICIPAL SOLID WASTE

#### 1. Scope

1.1 The method describes the procedures for measuring the composition of unprocessed municipal solid waste (MSW) by employing manual sorting. The procedure applies to the determination of the mean composition of MSW based on the collection and manual sorting of a number of samples of waste over a selected period of time with a minimum of one week.

1.2 The procedures include those for collection of a representative sorting sample of unprocessed waste, manual sorting of the waste into individual waste components, data reduction, and reporting of results.

1.3 The method may be applied at landfill sites, waste processing and conversion facilities, and transfer stations.

#### 2. Definitions

2.1 Sorting Sample: A 200 to 300 lb portion that is deemed to represent the characteristics of a vehicle load of MSW.

2.2 Unprocessed Municipal Solid Waste: Solid waste in its discarded form, i.e., waste that has not been size reduced or otherwise processed.

2.3 Waste Component: A category of solid waste composed of materials of similar physical properties and chemical composition, which is used to define the composition of solid waste, e.g., ferrous, glass, newsprint, yard waste, aluminum, etc.

2.4 Solid Waste Composition or Waste Composition: The characterization of solid waste as represented by a breakdown of the mixture into specified waste components on the basis of mass fraction or of weight percentage.

2.5 Composite Item: An object in the waste that is composed of multiple waste components or dissimilar materials, such as disposable diapers, bi-metal beverage containers, electrical conductor composed of metallic wire encased in plastic insulation, etc.

#### 3. Summary of Methods

3.1 The number of samples to be sorted is calculated based upon statistical criteria selected by the investigators.

3.2 Vehicle loads of waste are designated for sampling, and a sorting sample is collected from the discharged vehicle load.

3.3 The sorting sample is manually sorted into waste components. The weight fraction of each component in the sorting sample is calculated from the weights of the components.

3.4 The mean waste composition is calculated using the results of the composition of each of the sorting samples.

#### 4. Significance and Use

4.1 Waste composition information has wide application and can be used for such activities as solid waste planning, designing waste management facilities, and establishing a reference waste composition for use as a baseline standard in facility contracts and in acceptance test plans.

4.2 The method can be used to define and report the composition of municipal solid waste through the selection and manual sorting of samples of waste. Care should be taken to consider the source and seasonal variation of waste, where applicable.

4.3 After performing a waste composition analysis, laboratory analyses may be performed on representative samples of waste components or mixtures of waste components for purposes related to the planning, management, design, testing, and operation of resource recovery facilities.

#### 5. Apparatus

5.1 Sufficient metal, plastic, or fiber containers for storing and weighing each waste component, labeled accordingly. For components that will have a substantial moisture content (e.g., food waste), metal or plastic containers are recommended to avoid absorption of moisture by the container and, thus, the need for a substantial number of weighings to maintain an accurate tare weight for the container.

5.2 A mechanical or electronic weigh scale with a capacity of at least 200 lb, and a precision of at least 0.1 lb.

5.3 Heavy-duty tarps, shovels, rakes, push brooms, dust pans, hand brooms, magnets, sorting table, first aid kit, miscellaneous small tools, traffic cones, traffic vests, leather gloves, hardhats, safety glasses, and leather boots.

#### 6. Precautions

6.1 Review the precautions and procedures with the operating and sorting personnel prior to the conduct of the field activities.

6.2 Sharp objects such as nails, razor blades, hypodermic needles, and pieces of glass are present in solid waste. Personnel should be instructed of this danger and to brush waste particles aside while sorting, as opposed to projecting their hands with force into the mixture. Personnel handling and sorting solid waste should wear appropriate protection. Appropriate protection includes heavy leather gloves, hardhats, safety glasses, and safety boots.

6.3 During the process of unloading waste from collection vehicles and of handling waste with heavy equipment, projectiles may issue from the mass of waste. The projectiles can include flying glass particles from breaking glass containers and metal lids from plastic and metal containers that burst under pressure when run over by heavy equipment. The problem is particularly severe when the waste handling surface is of high compressive strength, e.g., concrete. Personnel should be made aware of the danger and wear eye and head protection if in the vicinity of the collection vehicle unloading point, or in the vicinity of heavy equipment, or both.

6.4 Select a location for discharge of designated loads, manual sorting activities, and weighing operation that is flat, level, and away from the normal waste handling and processing areas.

6.5 Weigh storage containers each day, or more frequently if necessary, in order to maintain an accounting of the tare weight.

## 7. Calibration

7.1 All weigh scale equipment shall be calibrated according to the manufacturer's instructions. Take appropriate corrective action if the readings are different than the calibration weights.

## 8. Procedures

8.1 Secure a flat and level area for discharge of the vehicle load. The surface should be swept clean or covered with a clean, durable tarp prior to discharge of the load.

8.2 Position the scale on a clean, flat, and level surface and adjust the level of the scale if necessary. Check the accuracy and operation of the scale with a known (i.e., reference) weight.

8.3 Weigh all empty storage containers and record the tare weights.

8.4 Determine the number of sorting samples to be sorted. The determination is a function of the waste components to be sorted and the desired precision as applied to each component. Weights of 200 to 300 lb for sorting samples of unprocessed solid waste are recommended. The number of samples is determined using the calculational method described in section 9.1.

8.5 A comprehensive list of waste components for sorting is shown in Table A. A description of some of the waste component categories is given in Table B. Other waste components can be defined and sorted depending upon the purpose of the waste composition determination. The list in Table A is comprised of those components most commonly used to define and report the composition of solid waste. At a minimum, it is recommended that the complement of left-justified categories in Table A be sorted. Therefore, similar breakdowns of solid waste composition are available for purposes of comparison, if desired. Label the storage containers accordingly.

TABLE A. List of Waste Component Categories

Mixed Paper	Other Organics
High Grade Paper	Ferrous
Computer Printout	Cans
Other Office Paper	Other Ferrous
Newsprint	Aluminum
Corrugated	Cans
Plastic	Foil
PET Bottles	Other Aluminum
HDPE Bottles	Glass
Film	Clear
Other Plastic	Brown
Yard Waste	Green
Food Waste	Other Inorganics
Wood	

TABLE B. Description of Some Waste Component Categories

Category	Description
Mixed Paper	Office paper, computer paper, magazines, glossy paper, waxed paper, other paper not fitting categories of "Newsprint" and "Corrugated"
Newsprint	Newspaper
Corrugated	Corrugated medium, corrugated boxes or cartons, brown (kraft) paper (i.e., corrugated) bags
Plastic	All plastics
Yard Waste	Branches, twigs, leaves, grass, other plant material
Food Waste	All food waste except bones
Wood	Lumber, wood products, pallets, furniture
Other Organics/ Combustibles	Textiles, rubber, leather, other primarily burnable materials not included in the above component categories
Ferrous	Iron, steel, tin cans, bi-metal cans
Aluminum	Aluminum, aluminum cans, aluminum foil
Glass	All glass
Other Inorganics/ Non-combustibles	Rock, sand, dirt, ceramics, plaster, non-ferrous non-aluminum metals (copper, brass, etc.), bones

8.6 Vehicles for sampling shall be selected at random during each day of the one-week sampling period, or so as to be representative of the waste stream as agreed to by the affected parties. With respect to random selection of vehicles, any method is acceptable that does not introduce a bias into the selection. An acceptable method is use of a random number generator. For a weekly sampling period of  $k$  days, the number of vehicles sampled each day shall be approximately  $n/k$ , where  $n$  is the total number of vehicle loads to be selected for determination of waste composition. A weekly period is defined to be 5 to 7 days.

8.7 Direct the designated vehicle containing the load of waste to the area secured for discharge of the load and collection of the sorting sample.

8.8 Direct the vehicle operator to discharge the load onto the clean surface in one contiguous pile, i.e., to avoid gaps in the discharged load. Collect any required information from the vehicle operator prior to the vehicle leaving the discharge area.

8.9 Using mechanical equipment, remove material longitudinally along one entire side of the discharged load, sufficient to form a mass of material which, on a visual basis, is at least four times the desired weight of the sorting sample (i.e., about 1,000 lb). Mix, cone and quarter the material and select one quarter to be the sorting sample, using a random method of selection or a sequence agreed to by all affected parties, for the purpose of eliminating or minimizing biasing of the sample. If an oversize item (e.g., water heater) composes a large weight percentage of the sorting sample, add a notation on the data sheet and weigh it, if possible.

8.10 One sorting sample is selected from each collection vehicle load that is designated for sampling. All handling and manipulation of the discharged load, longitudinal sample, and sorting sample shall be conducted on previously cleaned surfaces. If necessary, remove the sorting sample to a secured manual sorting area. The sorting sample may be placed on a clean table for sorting for the convenience of the sorting personnel. The sorting area shall be a previously cleaned, flat, and level surface.

8.11 Position the storage containers around the sorting sample. From the sorting sample, empty all containers such as capped jars, paper bags, and plastic bags of their contents. Segregate each waste item and place it in the appropriate storage container.

8.12 In the case of composite items found in the waste, separate the individual materials where practical and place the individual materials into the appropriate storage containers. Where impractical, segregate and classify the composite item according to the following order:

8.12.1 If there are many identical composite items (e.g., plastic-sheathed aluminum electrical conductor), place them into the waste component containers corresponding to the materials present in the item and in the approximate proportions according to the estimated mass fraction of each material in the item.

8.12.2 If there are only a few of the identical composite item, place them in the storage container corresponding to the material which comprises, on a weight basis, the majority of the item (e.g., place bi-metal beverage cans in the ferrous container).

8.12.3 If composite items represent substantial weight percentages of the sorting sample, a separate category should be established, e.g., composite roofing shingles.

8.12.4 If none of the above procedures is appropriate, place the item(s) (or proportion it (them)) in the storage container labeled "Other Non-Combustible" or "Other Combustible" as appropriate.

8.13 Sorting continues until the maximum particle size of the remaining waste particles is approximately 0.5 in. At this point, apportion the remaining particles into the storage containers corresponding to the waste components represented in the remaining mixture. The apportionment shall be accomplished by making a visual estimate of the mass fraction of waste components represented in the remaining mixture.

8.14 Record the gross weights of the storage containers and of any waste items sorted but not stored in containers. The data sheet shown in Fig. 1 can be used to record gross weights as well as tare weights.

8.15 After recording the gross weights, empty the storage containers and weigh them again, if appropriate. Re-weighing is important and necessary if the containers become moisture-laden, e.g., from wet waste.

8.16 Clean the sorting site as well as the load discharge area of all waste materials.

## 9. Calculations

9.1 Number of 200 to 300 lb samples.

9.1.1 The number of sorting samples (i.e., vehicle loads) (n) required to achieve a desired level of measurement precision is a function of the component(s) under consideration, and the confidence level. The governing equation for n is:

$$n = (t^* s / e \cdot \bar{x})^2 \quad (1)$$

where  $t^*$  is the student t statistic corresponding to the desired level of confidence,  $s$  is the estimated standard deviation,  $e$  is the desired level of precision, and  $\bar{x}$  is the estimated mean.

All numerical values for the symbols are in decimal notation. For example, a value of precision ( $e$ ) of 20% is represented as 0.2.

One sorting sample is chosen per vehicle load.

Waste Composition Data Sheet

Day/Date: \_\_\_\_\_  
 Site: \_\_\_\_\_  
 Weather: \_\_\_\_\_

Collection Company: \_\_\_\_\_  
 Vehicle Type: \_\_\_\_\_  
 Route No.: \_\_\_\_\_  
 Recorded by: \_\_\_\_\_

Component	Weight in Pounds		Percent of Total
	Gross	Tare	
Mixed Paper			
High Grade Paper			
Computer Printout			
Other Office Paper			
Newsprint			
Corrugated			
Plastic			
PET bottles			
HDPE bottles			
Film			
Other Plastic			
Food Waste			
Wood			
Other Organics			
Ferrous			
Cans			
Other Ferrous			
Aluminum			
Cans			
Foil			
Other Aluminum			
Glass			
Clear			
Brown			
Green			
Other Inorganics			

TOTALS \_\_\_\_\_

NOTES: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Lab sample taken? Yes \_\_\_ No \_\_\_

Figure 1. Waste Composition Data Sheet

Suggested values of  $s$  and of  $\bar{x}$  for waste components are listed in Table C. Values of  $t^*$  are given in Table D for 90% and 95% levels of confidence, respectively.

9.1.2 Estimate the number of samples ( $n'$ ) for the selected conditions (i.e., precision and level of confidence) and components using equation 1. For the purpose of estimation, select from Table D the  $t^*$  value for  $n = \infty$  for the selected level of confidence. Since the required number of samples will vary among the components for a given set of conditions, a compromise will be required in terms of selecting a sample size, i.e., the number of samples that will be sorted. The component that is chosen to govern the precision of the composition measurement (and therefore the number of samples required for sorting) is termed the "governing component" for the purpose of this method.

9.1.3 After determining the governing component and its corresponding number of samples ( $n_0$ ), return to Table D and select the student  $t$  statistic ( $t^*_0$ ) corresponding to  $n_0$ . Recalculate the number of samples, i.e.,  $n'$ , using  $t^*_0$ .

9.1.4 Compare  $n_0$  to the new estimate of  $n$ , i.e.,  $n'$ , which was calculated for the governing component. If the values differ by more than 10%, repeat the calculations of 9.1.2 and 9.1.3.

9.1.5 If the values are within 10%, select the larger value as the number of samples to be sorted. Refer to Appendix A for a sample calculation of  $n$ .

## 9.2 Component Composition

9.2.1 The component composition of solid waste is reported on the basis of the mass fraction (expressed as a decimal) or percentage of waste component  $i$  in the solid waste mixture. The reporting is on the basis of wet weight, i.e., the weight of materials immediately after sorting.

9.2.2 The mass fraction of component  $i$ ,  $mf_i$ , is defined and computed as:

$$mf_i = \frac{w_i}{\sum_{i=1}^j w_i} \quad (2)$$

where  $w_i$  is the weight of component  $i$  and  $j$  is the number of waste components. In those cases where a container is used to store and weigh the materials:

$$w_i = \text{gross weight} - \text{tare weight of container} \quad (3)$$

TABLE C. Values of Mean ( $\bar{x}$ ) and of Standard Deviation (s) for Within Week Sampling to Determine MSW Component Composition<sup>A</sup>

Component	Standard Deviation (s)	Mean ( $\bar{x}$ )
Mixed Paper	0.05	0.22
Newsprint	0.07	0.10
Corrugated	0.06	0.14
Plastic	0.03	0.09
Yard Waste	0.14	0.04
Food Waste	0.03	0.10
Wood	0.06	0.06
Other Organics	0.06	0.05
Ferrous	0.03	0.05
Aluminum	0.004	0.01
Glass	0.05	0.08
Other Inorganics	0.03	<u>0.06</u>
		1.00

A) The tabulated mean values and standard deviations are estimates based on field test data reported for municipal solid waste sampled during weekly sampling periods at several locations around the U.S.

TABLE D. Values of t Statistics (t\*) as a Function of Number of Samples and Confidence Interval

No. of Samples (n)	90%	95%
2	6.314	12.706
3	2.920	4.303
4	2.353	3.182
5	2.132	2.776
6	2.015	2.571
7	1.943	2.447
8	1.895	2.365
9	1.860	2.306
10	1.833	2.262
11	1.812	2.228
12	1.796	2.201
13	1.782	2.179
14	1.771	2.160
15	1.761	2.145
16	1.753	2.131
17	1.746	2.120
18	1.740	2.110
19	1.734	2.101
20	1.729	2.093
21	1.725	2.086
22	1.721	2.080
23	1.717	2.074
24	1.714	2.069
25	1.711	2.064
26	1.708	2.060
27	1.706	2.056
28	1.703	2.052
29	1.701	2.048
30	1.699	2.045
31	1.697	2.042
36	1.690	2.030
41	1.684	2.021
46	1.679	2.014
51	1.676	2.009
61	1.671	2.000
71	1.667	1.994
81	1.664	1.990
91	1.662	1.987
101	1.660	1.984
121	1.658	1.980
141	1.656	1.977
161	1.654	1.975
189	1.653	1.973
201	1.653	1.972
-	1.645	1.960

9.2.3 The percentage of component  $i$ ,  $P_i$ , is defined and computed as:

$$P_i = mf_i \times 100 \quad (4)$$

9.2.4 For the data analysis to be correct, the denominator of equation (2) must be unity and,

$$\sum_{i=1}^j P_i = 100 \quad (5)$$

9.3 The mean component composition for the one-week period is calculated using the component composition results from each of the analysis samples. The mean mass fraction of component  $i$ ,  $\overline{mf}_i$ , is calculated as:

$$\overline{mf}_i = \frac{1}{n} \sum_{k=1}^n (mf_i)_k \quad (6)$$

and the mean percentage of component  $i$ ,  $\overline{P}_i$ , is calculated as,

$$\overline{P}_i = \frac{1}{n} \sum_{k=1}^n (P_i)_k \quad (7)$$

where  $n$  is the number of samples.

## APPENDIX A. ESTIMATE OF NUMBER OF SAMPLES FOR ANALYSIS

### ASSUMPTIONS

1. Corrugated is selected as the governing component
2. A 90% confidence level is selected
3. A precision of 10% is desired

Therefore:

$$\begin{aligned}s &= 0.06 \text{ (from Table C)} \\ \bar{x} &= 0.14 \text{ (from Table C)} \\ e &= 0.10 \\ t^* (n = \infty) &= 1.645 \text{ (from Table D)}\end{aligned}$$

Using equation 1:

$$\begin{aligned}n &= [t^* s / (e \cdot \bar{x})]^2 \\ &= \left[ \frac{1.645 (0.06)}{0.1 (0.14)} \right]^2 \\ &= 50 \\ &= n_0\end{aligned}$$

Referring again to Table D, for  $n = 50$

$$t^*_{90} (n = 50) = 1.677$$

and,

$$\begin{aligned}n &= \left[ \frac{1.677 (0.06)}{0.1 (0.14)} \right]^2 \\ &= 52 \\ &= n'\end{aligned}$$

Since 52 (i.e.,  $n'$ ) is within 10% of 50 (i.e.,  $n_0$ ), 52 samples should be selected for analysis.



**Table 1.1**

In 1991 a total of **6246** tons of solid waste was disposed from the Los Altos Hills waste stream. A detailed breakdown of the tonnage is provided below:

**Residential**

A total of **3131** tons of waste was disposed from the residential sector as follows:

- can service:	2409.20 tons
- bin service:	134.26 tons
- clean-up program:	587.25 tons
Total disposed:	<b>3131</b> tons disposed

**Industrial (Debris Boxes)**

A total of **3079** tons of waste was disposed from the industrial sector as follows:

- Debris boxes to Newby Island Landfill and Zanker Road Landfill	3079 tons
Total disposed:	<b>3079</b> tons

**Self-haul**

Tonnage for self-haul loads remains at **36** tons as provided in the study prepared by Cal Recovery.

- Self-haul:	36 tons
Total disposed:	<b>36</b> tons

**Table 1-2**

Table 1-2 has been revised to show *Projected Annual Quantities of Disposed Waste for Los Altos Hills* using "actual" tonnage information provided by Los Altos Garbage Company for the year 1991 at 6246 tons.

The information provided by Los Altos Garbage Company, the franchised waste hauler for the Town of Los Altos Hills is "actual" and based on weight tickets provided by the landfills. The Cal Recovery Study shows significant tonnage from the industrial sector in comparison to the actual tonnage data provided by Los Altos Garbage Company. Since the Cal Recovery study extrapolated survey data to cover a period of a year it is not deemed as factual as the information and revised tables provided by Los Altos Garbage Company, therefore the information compiled by Los Altos Garbage Company is used throughout this SRRE.

Table 1.1

## 1991 Disposed Waste Characterization

Material	Residential (D) %	Residential TPY	Industrial %	Industrial TPY	Self-Haul %	Self-Haul TPY	Total Disposed %	Total Disposed TPY
<b>Total Paper</b>	<b>45.2%</b>	<b>1415</b>	<b>2.2%</b>	<b>68</b>	<b>7.6%</b>	<b>3</b>	<b>23.8%</b>	<b>1486</b>
OCC/Kraft	6.6%	207	1.4%	43	3.7%	1	4.0%	251
Mixed	24.5%	767	0.5%	15	3.4%	1	12.5%	783
Newspaper	4.9%	153	0.0%	1	0.4%	1	2.5%	155
High-Grade	0.5%	16	0.0%	0	0.0%	0	0.3%	16
Other	8.7%	272	0.3%	9	0.1%	0	4.5%	281
<b>Total Plastics</b>	<b>9.0%</b>	<b>282</b>	<b>3.0%</b>	<b>92</b>	<b>3.0%</b>	<b>1</b>	<b>6.0%</b>	<b>375</b>
HDPE	1.1%	34	0.2%	6	0.0%	0	0.7%	41
PET	0.3%	9	0.0%	0	0.0%	0	0.2%	9
Film	4.0%	125	0.0%	0	1.3%	0	2.0%	126
Other	3.6%	113	2.8%	86	1.7%	1	3.2%	200
<b>Total Glass</b>	<b>3.1%</b>	<b>97</b>	<b>1.0%</b>	<b>31</b>	<b>0.6%</b>	<b>0</b>	<b>2.1%</b>	<b>129</b>
Refillable Beverage	0.1%	3	0.0%	1	0.0%	0	0.1%	4
Can Redemption	0.7%	22	0.2%	6	0.1%	0	0.5%	28
Other Recyclable	2.0%	63	0.5%	15	0.0%	0	1.2%	78
Other Non-Recyclable	0.3%	9	0.3%	9	0.5%	0	0.3%	19
<b>Total Metals</b>	<b>5.5%</b>	<b>172</b>	<b>8.7%</b>	<b>268</b>	<b>13.3%</b>	<b>5</b>	<b>7.1%</b>	<b>445</b>
Aluminum Cans	0.2%	6	0.0%	0	0.1%	0	0.1%	6
Aluminum	0.0%	0	0.0%	0	0.0%	0	0.0%	0
Bi-metal	1.4%	44	0.0%	0	0.0%	0	0.7%	44
Tin/FIB	0.2%	6	1.4%	43	0.7%	0	0.8%	50
Non-Ferrous	0.0%	0	2.5%	77	4.2%	2	1.3%	78
White Goods	3.7%	116	4.8%	148	8.3%	3	4.3%	287
Other								
<b>Yard Waste</b>	<b>11.4%</b>	<b>357</b>	<b>14.2%</b>	<b>437</b>	<b>5.1%</b>	<b>2</b>	<b>12.7%</b>	<b>796</b>
<b>Other Organics</b>	<b>23.4%</b>	<b>733</b>	<b>61.7%</b>	<b>1900</b>	<b>28.5%</b>	<b>10</b>	<b>42.3%</b>	<b>2643</b>
Food	13.6%	426	0.0%	0	0.4%	0	6.8%	426
Tires/Rubber	0.9%	28	2.8%	86	0.5%	0	1.8%	115
Wood	2.1%	66	36.3%	1118	20.2%	7	19.1%	1191
Ag Crop Residue	0.0%	0	0.0%	0	0.0%	0	0.0%	0
Manure	0.0%	0	0.0%	0	0.0%	0	0.0%	0
Textile/Leather	2.8%	88	0.8%	25	6.1%	2	1.8%	114
Other Misc. Organic	4.0%	125	21.8%	671	1.4%	1	12.8%	797
<b>Other Wastes</b>	<b>2.2%</b>	<b>69</b>	<b>9.2%</b>	<b>283</b>	<b>41.5%</b>	<b>15</b>	<b>5.9%</b>	<b>366</b>
Imports	2.1%	66	9.2%	283	41.5%	15	5.8%	364
HHW	0.1%	2	0.0%	0	0.0%	0	0.0%	2
<b>SPECIAL WASTES a)</b>	<b>0.2%</b>	<b>6</b>	<b>0.0%</b>	<b>0</b>	<b>0.4%</b>	<b>0</b>	<b>0.1%</b>	<b>6</b>
<b>TOTAL</b>	<b>100.0%</b>	<b>3131</b>	<b>100.0%</b>	<b>3079</b>	<b>100.0%</b>	<b>36</b>	<b>100.0%</b>	<b>6246</b>

a) Small Household Appliances  
b) Commercial Waste Included In Residential

Note: Debris box loads are categorized as "Industrial"

Note: Waste composition percentages by material type derived from Cal Recovery's Waste Generation Study have been applied to actual disposed tonnage information compiled by LAGCO for this table.

Table 1-2

Projected Annual Quantities of Disposed Waste for Los Altos Hills (Tons/Year)  
Existing Disposal with Current Programs

Material	Year:	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
	Esc factor a):	1,002	1,002	1,002	1,002	1,002	1,002	1,006	1,006	1,006	1,006	1,000	1,000	1,000	1,000	1,000	1,000
1) TOTAL PAPER		1486	1489	1462	1495	1498	1501	1510	1519	1528	1537	1537	1537	1537	1537	1537	1537
OCC/Kraft		251	252	252	253	253	254	255	257	258	260	260	260	260	260	260	260
Mixed Paper		783	786	786	786	786	791	786	800	805	810	810	810	810	810	810	810
Newsprint		155	155	156	156	156	157	157	158	159	160	160	160	160	160	160	160
High Grade		16	16	16	16	16	16	16	16	16	17	17	17	17	17	17	17
Other Paper		281	282	282	283	283	284	286	287	289	291	291	291	291	291	291	291
2) TOTAL PLASTICS		375	376	377	377	378	379	381	383	386	388	388	388	388	388	388	388
HDPE		41	41	41	41	41	41	42	42	42	42	42	42	42	42	42	42
PET		9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Film		126	126	127	127	127	127	128	129	130	130	130	130	130	130	130	130
Other Plastics		200	200	201	201	202	202	203	204	206	207	207	207	207	207	207	207
3) TOTAL GLASS		129	129	130	130	130	130	131	132	133	133	133	133	133	133	133	133
Refillable Glass Bev.		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Calif Redemption Value		28	28	28	28	28	28	28	29	29	29	29	29	29	29	29	29
Other Recyclable		78	78	78	78	79	79	79	80	80	81	81	81	81	81	81	81
Other Non Recyclable		19	19	19	19	19	19	19	19	20	20	20	20	20	20	20	20
4) TOTAL METALS		445	446	447	448	449	449	452	455	458	460	460	460	460	460	460	460
Aluminum Cans		6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Bimetal Cans		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tin P/B Cans		44	44	44	44	44	44	45	45	45	46	46	46	46	46	46	46
Non FE/Other Alum		50	50	50	50	50	51	51	51	51	52	52	52	52	52	52	52
White Goods		78	78	78	78	79	79	79	80	80	81	81	81	81	81	81	81
Other Metal		267	268	268	269	269	270	271	273	275	276	276	276	276	276	276	276
5) YARD WASTES		796	798	799	801	802	804	809	814	819	823	823	823	823	823	823	823
6) OTHER ORGANICS		2643	2648	2654	2659	2664	2670	2686	2702	2718	2734	2734	2734	2734	2734	2734	2734
Food		426	427	428	429	429	430	433	435	438	441	441	441	441	441	441	441
Tires/Rubber		115	115	115	116	116	116	117	118	118	119	119	119	119	119	119	119
Wood		1191	1193	1196	1198	1201	1203	1210	1217	1225	1232	1232	1232	1232	1232	1232	1232
Ag Crop Residue		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Manure		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Textiles/Leather		114	114	114	115	115	115	116	117	117	118	118	118	118	118	118	118
Other Misc Organics		797	799	800	802	803	805	810	815	820	824	824	824	824	824	824	824
7) OTHER WASTES		366	367	367	368	369	370	372	374	376	379	379	379	379	379	379	379
Inert Solids		364	365	365	366	367	368	370	372	374	377	377	377	377	377	377	377
HHW		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
8) OTHER SPECIAL WASTES b)		6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
TOTAL		6246	6258	6271	6284	6296	6309	6347	6385	6423	6461	6461	6461	6461	6461	6461	6461

a) Escalation factor (Esc factor) is based on projected population data as reported by ABAG  
b) Small Household Appliances

Note: Total may not sum exactly due to rounding

Note: Disposal tonnages in Table 1-2 will differ from disposal tonnages found in other tables due to subsequent tables generation numbers are projected using Esc factor as opposed to the disposed tonnage.



**GUIDE TO USE OF WASTE DIVERSION DATA**

## APPENDIX A

### GUIDE TO USE OF WASTE DIVERSION DATA

---

A focused waste diversion study was undertaken in January and February, 1991 that targeted materials brokers and end users in the County. Types of businesses targeted in the survey included recycling collectors, materials brokers, end users of secondary materials, and outlets for local secondary materials markets.

Following data interpretation and reduction, the results of the surveys were summarized on a city-by-city basis in Tables 1 through 4. These tables are as follows:

- Table 1: Residential Diversion Quantities  
(1 table for each city)
- Table 2: Commercial/Industrial Diversion Quantities  
(1 table for each city)
- Table 3: Summary of Santa Clara County Residential Diversion Quantities
- Table 4: Summary of Santa Clara County Commercial/Industrial Diversion Quantities

This section summarizes (1) limitations of the data, (2) recommendations for obtaining additional diversion data, and (3) the manner in which the data can be used to calculate the diversion rate.

#### Notes Regarding the Tables

The following should be noted in reviewing the data presented in Tables 1 through 4:

1. Some data were reported for whole regions of the County. Where this occurred, the data were apportioned based

upon the population ratio of those areas for which the data was reported.

2. Industrial wastes are included in the table with commercial (except where broken out specifically) because collectors do not distinguish by source in their records.
3. Apartment recycling is generally not reported separate from residential recycling. However, because of the different type of collection system, a column is provided for separate reporting. One advantage of keeping separate accounting for this material is that a separate public education program is often designed for apartment dwellers, and this accounting would enable tracking of the success of such a program.
4. The data for landfill salvaging were placed in the commercial table. The suppliers of the data were not able to separate it out by source because of the nature of the operation.
5. Data on glass tonnages from some cities were reported as commingled. According to the Department of Conservation (DOC), as of March 1, commingled glass coming from curbside programs is assumed to contain 60 percent California redemption value glass, whereas commingled glass from a certified redemption center is assumed to contain 75 percent. This percentage is based on a recent survey for DOC and thus used for this study.
6. The results for tires show quantities recycled and transformed. Some tires are sent to Mexico to be recapped. Of the quantity of tires sent to transformation, 25 percent are recovered as casings and used tires before being transformed into electricity. Of the 75 percent transformed, 25 percent is recovered as by-products: gypsum, zinc, and steel. Thus, the data reported were apportioned in this manner.

## **Additional City-Specific Considerations**

The County contracted with EMCON to survey recyclers only; surveying businesses in each city, although time consuming and expensive, would provide a more complete picture of the recycling and source reduction activities occurring in each jurisdiction for future planning and tracking. This method was chosen by four cities in the County with independent contracts: Milpitas, Santa Clara, Sunnyvale, and Palo Alto. Other cities may wish to survey businesses as a means of obtaining a baseline with which to compare diversion in future years. However, the results of such a survey can not be simply added to the diversion totals in this report because of the likelihood of double-counting quantities of some materials.

A focused survey of businesses may be worth considering. For example, a city may wish to survey the 30 largest waste generators in its jurisdiction for diversion information for specific commodities, such as paper and scrap metal, for inclusion in the diversion study. The quantities reported for these materials in Tables 1 through 4 are lower than the actual recycling rate, since few paper and scrap metal brokers were willing to provide data.

EMCON documented the use of reusable diapers as the only source reduction activity for the city. The city can survey residents and businesses regarding additional source reduction activities for inclusion in the waste diversion study.

## **Use of Diversion Data in Calculating Diversion Rate**

The quantities of materials diverted by waste type, which is required as part of the Source Reduction and Recycling Element (SRRE), can be calculated as a percent diversion by the following method, once the disposal quantities are known. See Attachment 5 for an example of how to summarize the disposal and diversion information to determine the diversion rate. The steps are as follows:

- calculate the tons/year disposed by waste type and waste generator
- tally these quantities by waste type
- in a separate column, tally the quantity of waste diverted for each waste type

- add up the quantities disposed and diverted to determine the total quantity in tons/year generated by waste type (disposed + diverted = total generated)
- divide the quantity recycled and source reduced by the total generated to determine the diversion rate  $[(\text{recycling} + \text{source reduction})/\text{total generated} = \text{diversion rate percent}]$

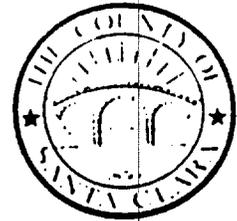


SURVEY FORM SENT TO RECYCLERS

# County of Santa Clara

Department of Planning and Development  
Office of Toxics and Solid Waste Management

1735 North First Street, Suite 275  
San Jose, California 95112  
Toxics (408) 441-1195  
Solid Waste (408) 441-1198



January 25, 1991

## Recycling Survey

Dear Santa Clara County Recycler:

The County of Santa Clara needs your help in providing information on the amount of solid waste (garbage) being recycled or reduced within the County limits.

As you may already know, under AB 939, a waste management law adopted in 1989, all cities and counties in the State of California are required to document the type and quantity of waste materials that are being generated, diverted, or reduced in any way. The County of Santa Clara and each of its cities must submit this information in a report that describes how the County and the cities will recycle 25 percent of their waste by 1995 and 50 percent by the year 2000. The maximum fine to counties and cities for failure to comply is \$10,000 per day.

To help us determine the amount of commercial and industrial wastes currently being recycled or otherwise diverted from landfills in the County, please complete the enclosed survey, copy and complete a Material Report Form on the reverse side for the unincorporated county and cities you serve, and return them in the enclosed envelope by February 8 to the County's consultant, EMCON Associates, 1921 Ringwood Avenue, San Jose, CA 95131-9961.

The information you provide will be kept confidential. Only aggregate information will be reported to the County. Enclosed is a formal Confidentiality Agreement. If you choose to use this agreement, please enclose it with your completed survey.

Thank you very much for your response to this request. If you have questions about the survey, please contact Katherine Dever of EMCON at 408/453-7300. If you have questions about this project, or wish to discuss it further, please call me at 408/441-1198.

Sincerely,

A handwritten signature in black ink, appearing to read "Margaret J. Rands".

Margaret J. Rands, Solid Waste Program Manager

Enclosures



COUNTY OF SANTA CLARA RECYCLING SURVEY

to
Recycling Collectors and Brokers
operating within or receiving materials from within
the County of Santa Clara

The information in this survey will be kept confidential and will be used to prepare a report for the
County of Santa Clara and the incorporated cities in the County to comply with the California
Integrated Waste Management Act of 1989.

COMPANY NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

TELEPHONE: \_\_\_\_\_

CONTACT PERSON: \_\_\_\_\_ TITLE: \_\_\_\_\_

TYPE OF BUSINESS: (Please check all that apply.)

- Collector/Hauler, Dealer/Packer, Convenience Zone Redemption Center, Buy-Back Center, Donation Center, Non-profit Organization, Commercial Composter, News Bin Operator, Other Commercial Recycler, Special Waste Recycler, Broker, End market/Manufacturer, Scrap Metal Dealer, Auto Wrecker, Asphalt/Concrete Recycler, Demolition Debris Recycler, Wood Waste Chipper, Confidential Paper Service

When completed, please return this survey in the enclosed postpaid envelope to:
Katherine Dever, EMCON Associates, 1921 Ringwood Avenue, San Jose, California 95131.
If you have questions regarding this survey, call Ms. Dever at 408/453-7300.

1. On the following page, please include the TOTAL TONS of MATERIAL COLLECTED,
BY TYPE, for a recent twelve month period from an aggregate of accounts WITHIN THE
COUNTY OF SANTA CLARA, by unincorporated area and city jurisdiction only, not
from other sources.

Twelve month period used is from \_\_\_\_\_ to \_\_\_\_\_

- 2a. Anticipated increase in recycling tonnage for 1991: \_\_\_\_\_% or
2b. Anticipated decrease in recycling tonnage for 1991: \_\_\_\_\_%
3. Amount of residue: \_\_\_\_\_% of total amount collected which is not recyclable and is discarded.



SURVEY FORM SENT TO CITES

February 1, 1991

Dear

The Santa Clara County Solid Waste Program needs your help in collecting information on the amount of solid waste (garbage) being recycled, reduced or composted in your city.

This information will be used in preparing the Countywide Solid Waste Diversion Study, which is part of our Countywide AB 939 Implementation Project. This Study will determine the total amount currently diverted from landfill disposal, producing both a countywide total and totals for each jurisdiction ( 15 cities and the County).

To help us determine the amount of solid waste currently being diverted from landfills in the County and the identity of the purchaser of those materials that are being diverted, please fill out the enclosed tables (instructions are provided) and return them in the enclosed envelope by February 12 to the County's consultant, EMCON Associates, 1921 Ringwood Avenue, San Jose, CA 95131-9961.

The information you provide will be kept confidential. Only aggregate information will be reported to the County. Each city will receive a copy of the completed diversion study.

Thank you very much for your response to this request. If you have questions about the survey, please contact Katherine Dever of EMCON at 408/453-7300.

Sincerely,

Margaret J. Rands, Solid Waste Program Manager

Enclosures

## **INSTRUCTIONS FOR FILLING OUT TABLES**

Enclosed are the following tables:

- Table 1 Residential Diversion Programs (Tons/Year)
- Table 2 Residential Diversion Programs (Purchaser)
- Table 3 Commercial Diversion Programs (Tons/Year)
- Table 4 Commercial Diversion Programs (Purchaser)
- Table 5 Industrial Diversion Programs (Tons/Year)
- Table 6 Industrial Diversion Programs (Purchaser)
- Sample Form 1 Residential Diversion Programs (Tons/Year)
- Sample Form 2 Residential Diversion Programs (Purchaser)

Sample Forms 1 and 2 are provided as examples of the format to use when filling out the tables.

### **TABLE 1**

- 1.) List all residential diversion programs in your city across the top row.
- 2.) Report quantities of materials diverted from the residential waste stream through these programs in the corresponding box. Report quantities in tons per year.
- 3.) Sum the quantity of materials diverted by each program and report a total at the bottom of the column.
- 4.) Sum the quantity of each material diverted from all the programs and report a total in the last column.

### **TABLE 2**

- 1.) List all residential diversion programs in your city across the top row.
- 2.) Report the purchaser of the material that is being diverted from the residential waste stream in the corresponding box. For example, if ABC Aluminum is purchasing aluminum cans from your curbside program, report

ABC Aluminum in the box under the heading "curbside" and in the row "aluminum cans".

**TABLES 3, 4, 5 & 6**

1.) Fill out Tables 3 and 5 as you did Table 1, except list commercial and industrial diversion programs in your city.

2.) Fill out Tables 4 and 6 as you did Table 2, except list commercial and industrial diversion programs in your city.

**Sample Form 1. RESIDENTIAL DIVERSION PROGRAMS  
(Tons/Year)**

	Curbside	20/20	Apartment Recycler	Other Recycling Drop-off Programs	Composting	Source Reduction Programs	Total
corrugated containers							
newsprint							
high grade ledger paper	1000		20	200			1220
mixed paper							
other paper							
BTCS							
HDPE containers							
PET containers			2				2
film plastics							
other plastics							
SS							
refillable bev. containers							
CA Redemption Value	300		50				350
other recyclable glass	300		10	100			400
other non-recyclable glass							
ALS							
aluminum cans	50		10	2			62
bi-metal containers							
tin cans	40						40
other ferrous	100						100
other aluminum							
other non-ferrous							
white goods							
Y WASTE							
stems, grass							
brush, branches						800	800
ER ORGANICS						300	300
food waste							
tires/rubber						50	50
wood wastes							
agricultural crop residues							
manure							
textiles/leather							
diapers							
other misc. organics							
IER WASTES							
inert solids							
hazardous waste							
HAZARDOUS WASTE							
ash							
sewage sludge							
industrial sludge							
asbestos							
auto shredder waste							
auto bodies							
other special waste							
<b>TOTAL</b>	<b>1790</b>	<b>62</b>	<b>32</b>	<b>300</b>	<b>1100</b>	<b>50</b>	<b>3334</b>



**CONVERSION FACTORS**  
**National Recycling Coalition**  
**Densities for Recyclables**

Figure 4: Sample Weight to Volume Conversion Factors for Recyclables

<u>Material</u>	<u>Volume</u>	<u>Weight in Pounds</u>
Newsprint, Loose	one cubic yard	360 - 800
Newsprint, compacted	one cubic yard	720 - 1,000
Newsprint	12" stack	35
Corrugated cardboard, loose	one cubic yard	300
Corrugated cardboard, baled	one cubic yard	1000 - 1200
Glass, whole bottles	one cubic yard	600 - 1,000
Glass, semi crushed	one cubic yard	1,000 - 1,800
Glass, crushed (mechanically)	one cubic yard	800 - 2700
Glass, whole bottles	one full grocery bag	16
Glass, uncrushed to manually broken	55 Gallon Drum	125 - 500
PET soda bottles, whole, loose	one cubic yard	30 - 40
PET soda bottles, whole, loose	gaylord	40 - 53
PET soda bottles, baled	30" x 48" x 60"	500
PET soda bottles, granulated	gaylord*	700 - 750
PET soda bottles, granulated	semi-load	30,000
Film, baled	30" x 42" x 48"	1,100
Film, baled	semi-load	44,000
HPDE (dairy only), whole, loose	one cubic yard	24
HPDE (dairy only), baled	30" x 48 x 60"	500-800
HPDE (mixed), baled	30" x 48 x 60"	600-900
HPDE (mixed), granulated	gaylord	800 - 1,000
HPDE (mixed), granulated	semi-load	42,000
Mixed PET & Dairy, whole, loose	one cubic yard	average 32
Mixed PET, Dairy and other rigid, whole, loose	one cubic yard	average 38
Mixed rigid, no film or Dairy, whole loose	one cubic yard	average 49
Mixed rigid, no film, granulated	gaylord	500 - 1,000
Mixed rigid & film, densified by mixed plastic mold technology	one cubic foot	average 60
Aluminum cans, whole	one cubic yard	50 - 74
Aluminum cans, whole	1 one full kraft paper grocery bag	average 1.5
Aluminum cans	one 55 gal plastic bag	13 - 20

\* Gaylord size most commonly used 40" x 48" x 36"

## Figure 4: Sample Weight to Volume Conversion Factors for Recyclables

<u>Material</u>	<u>Volume</u>	<u>Weight in Pounds</u>
Ferrous cans, whole	one cubic yard	150
Ferrous cans, flattened	one cubic yard	850
Leaves, uncompacted <sup>8</sup>	one cubic yard	250 - 500
Leaves, compacted	one cubic yard	320 - 450
Leaves, vacuumed	one cubic yard	350
Wood chips	one cubic yard	500
Grass clippings	one cubic yard	400 - 1500
Used Motor Oil	one gallon	7
Tire - Passenger Car	one	12
Tire - Truck	one	60
Food Waste, solid and liquid fats	55 gallon drum	412

## VI. Conclusion

"Standard" is defined as "something considered by an authority or by general consent as a basis of comparison; an approved model; a rule or a principle that is used as a basis for judgement ...."<sup>9</sup>

While we believe that the recommendations presented here represent the best possible way of reporting and using data, we realize that complete agreement on every individual point isn't necessary for this work to serve as a "standard." Even where there may be disagreement about the application of a particular term or formula, the difference is made clearer by having a standard against which to contrast the alternative. The NRC offers these definitions, reporting guidelines, and calculation methods in that sense of the term: to serve as a common point of departure.

These concepts will have the best utility if indeed they do achieve widespread adoption, that is, if we all indeed begin to "speak the same language." To accomplish this, your participation is greatly needed to encourage the widespread testing and adoption of the NRC's National Measurement

Standards and Reporting Guidelines. Your reports of experience in applying these concepts in your programs, and your comments and criticism on this document, are invited and will be appreciated, for the preparation of future updates.

## VII. Notes

1 "The National Policy on Recycling" was adopted by the National Recycling Coalition at its Fifth Annual Recycling Congress in Seattle Washington, in November of 1986. Copies of this brochure are available from the NRC.

2 At the 1989 Membership Meeting, and in workshops held during the 1989 Congress, consensus could not be reached on these terms because some members expressed the opinion that a definition for integrated waste management must also include a specified hierarchy of priorities for waste management options, whereas others argued that this should be left unspecified. Furthermore, consensus could not be reached in defining the waste management hierarchy, because of lack of agreement regarding the ranking of incineration with energy recovery versus landfilling. These comments were consistent with other comments previously received throughout several drafts of the Standards document. Unchallenged was this portion of the definition:

"The waste management hierarchy is the prioritization of waste management strategies as follows: 1. Decreasing the generation of waste through source reduction, and 2. Decreasing disposal by maximizing materials recovery. "

3 The Glossary of Recycling Terms and Acronyms, contains more than 300 terms and is available for \$5 from Resource Recycling, P.O. Box 10540, Portland, Oregon 97210; 503-227-1319

4 This description is a direct paraphrase of comments provided by the Glass Packaging Institute.

5 This is a direct paraphrase of commentary provided by Resource Integration Systems/Resource Conservation Consultants.

6 A detailed methodology for deriving current recycling rates has been developed by Gilmore Research Group and The Matrix Management Group

4, 2, 5, 1, 0

## MODEL FOR CALCULATING DIVERSION RATE

Attachment 5 - Example of Diversion Rates by Material  
(TONS, 1990)

	DISPOSED		DIVERTED		TOTAL GENERATED		DIVERSION RATE (b/c) (Percent)
	(a)	Recycling	(b)	Source Reduction	(c)	(b/c)	
PAPER (total)	22,145	4,722	4067	0	30,114	8,789	46
OCC/Kraft		1,028	0	0		1,028	0
Magazines		7,349	0	0		7,349	0
Mixed Paper		4,006	3261	0		7,267	45
Newsprint		804	641	0		1,445	44
High Grade		4,235	0	0		4,235	0
Other Paper							
PLASTICS (total)	6,263	1,260	0	0	6,315	1,260	0
HDPE		553	52	0		605	9
PET		2,101	0	0		2,101	0
Film		332	0	0		332	0
Polystyrene Foam		2,016	0	0		2,016	0
Other Plastic							
GLASS (total)	3,277	0	0	0	5,021	0	0
Refillable Beverage		477	1744	0		2,221	79
CA Redemption Value		2,097	0	0		2,097	0
Other Recyclable		703	0	0		703	0
Other Non-Recyclable							
METALS (total)	3,921	221	797	0	4,835	1,018	78
Aluminum Cans		328	0	0		328	0
Other Aluminum		1,478	0	0		1,478	0
Steel Food & Bev. Cans		1,881	117	0		1,998	6
Other Ferrous		13	0	0		13	0
Other Non-ferrous		0	0	0		0	0
White Goods							
YARD WASTE (total)	2,165	1,937	0	0	2,165	1,937	0
Leaves and Grass		228	0	0		228	0
Branches and Brush							
OTHER ORGANICS (total)	18,735	10,992	0	0	18,746	10,992	0
Food		422	0	0		422	0
Rubber/Tires		1,126	0	0		1,126	0
Wood		0	0	0		0	0
Agri. Crop Residue		0	0	0		0	0
Manure		1,845	8	0		1,853	0
Textile/Leather		3,552	0	3		3,555	0
Diapers		798	0	0		798	0
Other Organics							
OTHER WASTES (total)	1,602	1,441	0	0	1,602	1,441	0
Inert Solids		161	0	0		161	0
HHW		0	0	0		0	0
Appliances		0	0	0		0	0
SPECIAL WASTES (total)	0	0	0	0	0	0	0
Ash		0	0	0		0	0
Sewage Sludge		0	0	0		0	0
Industrial Sludge		0	0	0		0	0
Asbestos		0	0	0		0	0
Auto Shredder Waste		0	0	0		0	0
Auto Bodies		0	0	0		0	0
Stuffed Furn./Mattresses		0	0	0		0	0
TOTAL	58,107	10,687	3	3	68,797	16	16

**Table 3-2  
Evaluation of Alternatives  
Recycling Component**

Program Alternative	Evaluation Criteria									
	Effectiveness	Hazard	Ability to Accommodate Change	Consequences to the Wastestream	Ease of Implementation	Facilities Requirements	Consistency with Local Policies	Institutional Barriers	Estimated Costs	Available Markets (End Uses)
<b>COLLECTION AND PROCESSING ALTERNATIVES</b>										
Alternative 1 Continued Curbside/Curbside Collection	HIGH	HIGH	HIGH	N/A	HIGH	HIGH	HIGH	HIGH	MEDIUM	MEDIUM
Alternative 2 Mobile Collection System	MEDIUM	HIGH	HIGH	N/A	HIGH	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM
Alternative 3 Buy-back Center	MEDIUM	HIGH	HIGH	N/A	HIGH	MEDIUM	HIGH	MEDIUM	LOW	MEDIUM
Alternative 4 Inerts Diversion	HIGH	MEDIUM	HIGH	N/A	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
Alternative 5 Manual Material Recovery Operation/ Mechanized Material Recovery	HIGH	MEDIUM	HIGH	N/A	MEDIUM	MEDIUM	HIGH	MEDIUM	MEDIUM	MEDIUM
Alternative 6 Salvage at Solid Waste Facility	HIGH	MEDIUM	MEDIUM	N/A	MEDIUM	MEDIUM	HIGH	MEDIUM	MEDIUM	MEDIUM
Alternative 7 Materials Handling Methods <b>INCENTIVE-BASED A.T.S.</b>	HIGH	HIGH	HIGH	N/A	MEDIUM	MEDIUM	HIGH	MEDIUM	MEDIUM	MEDIUM
Alternative 1 Zoning and Code Changes	MEDIUM	HIGH	MEDIUM	N/A	MEDIUM	N/A	MEDIUM	MEDIUM	HIGH	MEDIUM
Alternative 2 Rate Modifications	HIGH	MEDIUM	MEDIUM	MEDIUM	MEDIUM	N/A	HIGH	MEDIUM	MEDIUM	MEDIUM
Alternative 3 Market Development	MEDIUM	HIGH	MEDIUM	MEDIUM	MEDIUM	N/A	HIGH	MEDIUM	MEDIUM	MEDIUM

**Table 2-1  
Evaluation of Alternatives  
Source Reduction Component**

Program Alternative	Evaluation Criteria										
	Effectiveness	Hazard	Ability to Accommodate Change	Consequences to the Wastestream	Ease of Implementation	Facilitates Requirements	Consistency with Local Policies	Institutional Barriers	Estimated Costs	Available Markets (End Uses)	
Alternative 1 Rate Structure Modification	HIGH	MEDIUM	HIGH	HIGH	HIGH	HIGH	HIGH	MEDIUM	HIGH	N/A	
Alternative 2 Economic Incentives	HIGH	HIGH	HIGH	MEDIUM	MEDIUM	HIGH	MEDIUM	MEDIUM	LOW	N/A	
Alternative 3 Technical Assistance, Education & Prom	MEDIUM	HIGH	HIGH	HIGH	MEDIUM	HIGH	HIGH	HIGH	MEDIUM	N/A	
Alternative 4 Regulatory Programs	MEDIUM	HIGH	MEDIUM	MEDIUM	MEDIUM	HIGH	MEDIUM	MEDIUM	MEDIUM	N/A	

**Table 2 - 1**  
**Evaluation of Alternatives**  
**Source Reduction Component**

Program Alternative	Evaluation Criteria									
	Effectiveness	Hazard	Ability to Accommodate Change	Consequences to the Wastestream	Ease of Implementation	Facilities Requirements	Consistency with Local Policies	Institutional Barriers	Estimated Costs	Available Markets (End Uses)
Alternative 1 Rate Structure Modification	HIGH	MEDIUM	HIGH	HIGH	HIGH	HIGH	HIGH	MEDIUM	HIGH	N/A
Alternative 2 Economic Incentives	HIGH	HIGH	HIGH	MEDIUM	MEDIUM	HIGH	MEDIUM	MEDIUM	LOW	N/A
Alternative 3 Technical Assistance, Education & Prom	MEDIUM	HIGH	HIGH	HIGH	MEDIUM	HIGH	HIGH	HIGH	MEDIUM	N/A
Alternative 4 Regulatory Programs	MEDIUM	HIGH	MEDIUM	MEDIUM	MEDIUM	HIGH	MEDIUM	MEDIUM	MEDIUM	N/A

**Table 5-2  
Evaluation of Alternatives  
Special Wastes Component**

Program Alternative	Evaluation Criteria										
	Effectiveness	Hazard	Ability to Accommodate Change	Consequences to the Watershed	Ease of Implementation	Facilities Requirements	Consistency with Local Policies	Institutional Barriers	Estimated Costs	Available Markets (End Uses)	
Alternative 1 Disposal of Solid Wastes	LOW	MEDIUM	MEDIUM	N/A	HIGH	HIGH	MEDIUM	HIGH	MEDIUM	N/A	
Alternative 2 Sewage Sludge Composting	MEDIUM	MEDIUM	MEDIUM	N/A	LOW	MEDIUM	HIGH	HIGH	LOW	MEDIUM	
Alternative 3 Land Application of Sewage Sludge	MEDIUM	MEDIUM	MEDIUM	N/A	MEDIUM	MEDIUM	HIGH	MEDIUM	MEDIUM	MEDIUM	
Alternative 4 Divert Tires from Landfilling	MEDIUM	MEDIUM	MEDIUM	N/A	MEDIUM	MEDIUM	HIGH	MEDIUM	MEDIUM	HIGH	
Alternative 5 Prohibit Disposal of Tires	MEDIUM	MEDIUM	MEDIUM	N/A	MEDIUM	HIGH	HIGH	MED/HIGH	MEDIUM	HIGH	
Alternative 6 Prohibit Disposal of White Goods	MED/HIGH	MEDIUM	MEDIUM	N/A	HIGH	HIGH	HIGH	MED/HIGH	MED/HIGH	MED/HIGH	
Alternative 7 Process White Goods	MED/LOW	MEDIUM	MEDIUM	N/A	HIGH	HIGH	HIGH	MEDIUM	MEDIUM	HIGH	

**Table 5-2  
Evaluation of Alternatives  
Special Wastes Component**

Program Alternative	Evaluation Criteria										
	Effectiveness	Hazard	Ability to Accommodate Change	Consequences to the Watershed	Ease of Implementation	Facilities Requirements	Consistency with Local Policies	Institutional Barriers	Estimated Costs	Available Markets (End Uses)	
Alternative 1 Disposal of Solid Wastes	LOW	MEDIUM	MEDIUM	N/A	HIGH	HIGH	MEDIUM	HIGH	MEDIUM	N/A	
Alternative 2 Sewage Sludge Composting	MEDIUM	MEDIUM	MEDIUM	N/A	LOW	MEDIUM	HIGH	HIGH	LOW	MEDIUM	
Alternative 3 Land Application of Sewage Sludge	MEDIUM	MEDIUM	MEDIUM	N/A	MEDIUM	MEDIUM	HIGH	MEDIUM	MEDIUM	MEDIUM	
Alternative 4 Divert Tires from Landfilling	MEDIUM	MEDIUM	MEDIUM	N/A	MEDIUM	MEDIUM	HIGH	MEDIUM	MEDIUM	HIGH	
Alternative 5 Prohibit Disposal of Tires	MEDIUM	MEDIUM	MEDIUM	N/A	MEDIUM	HIGH	HIGH	MED/HIGH	MEDIUM	HIGH	
Alternative 6 Prohibit Disposal of White Goods	MED/HIGH	MEDIUM	MEDIUM	N/A	HIGH	HIGH	HIGH	MED/HIGH	MED/HIGH	MED/HIGH	
Alternative 7 Process White Goods	MED/LOW	MEDIUM	MEDIUM	N/A	HIGH	HIGH	HIGH	MEDIUM	MEDIUM	HIGH	