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PUBLIC WORKS DEPARTMENT

August 28, 1992

Margaret J. Rands
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Re: Cupertino SRRE and HHWE

The Final Drafts of the City of Cupertino Source Reduction and Recycling Element (SRRE) and Household Hazardous Waste Element (HHWE) have been completed. Enclosed are three (3) sets of the documents.

A public hearing is scheduled for the City Council meeting of September 21, 1992.

If you have any questions, please contact Mr. Steve Sano at (408) 252-4505.

CITY OF CUPERTINO

Steve Sano

for Bert J. Viskovich
Director of Public Works

BJV:sm
encl.

CITY OF CUPERTINO

CALIFORNIA

SOURCE REDUCTION

AND RECYCLING ELEMENT

Prepared by the Department of Public Works

10300 Torre Avenue
Cupertino, Ca 95014

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1. EXECUTIVE SUMMARY

1.1 INTRODUCTION

State Assembly Bill (AB)939 regulates local governments to divert 25 percent of all solid waste from landfill disposal through source reduction, recycling, and composting by January 1, 1995. And by January 1, 2000 the City must divert 50 percent of the waste stream. This bill also mandates that each City and County in the State of California develop a Source Reduction and Recycling Element (SRRE) for inclusion in the County integrated waste management plan.

1.2 CITY REQUIREMENTS

Each City must prepare, adopt and submit to the County a Source Reduction and Recycling Element (SRRE) that addresses the following components:

- Waste Characterization
- Source Reduction
- Recycling
- Composting
- Solid Waste Facility Capacity
- Public Education and Information
- Program Funding
- Special Wastes
- Program Integration
- A Household Hazardous Waste Element

1.3 CITY GOALS AND OBJECTIVES

1.3.1 Waste Characterization

The objectives 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.

Diversion includes source reduction, recycling, and composting.

The City of Cupertino disposed of approximately 36,392 tons of solid waste in 1991 at Newby Island landfill in San Jose.

The City has diverted approximately 9,044 tons from being landfilled in 1991.

Existing diversion is equal to approximately 19.9 percent of the total solid waste stream in 1991.

In compliance with AB 939, the City also conducted a waste characterization study to identify the composition and quality of solid wastes disposed of in the landfill.

A summary of the City's waste diverted is presented in table 1-2.

1.3.2 Source Reduction

Source reduction is defined in AB939 as "any action which causes a net reduction in the 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.

Short-term Planning Period.

- Variable Rate Structure
- Review Disposal Fees for White Goods
- Technical Assistance to Businesses
- Public Education
- Continue City Procurement Program

Medium-term Planning Period

All programs selected in the short-term planning period will be continued in the medium-term. In addition, the City has selected the following programs and alternatives (applies to all Medium-term Planning Period Sections that follow).

- Continue a program to establish waste reduction plans for large waste generators.
- Establish landuse requirements that support source reduction planning.
- Monitor efforts at the state level to encourage source reduction, including advance disposal fees, public education efforts, and other programs.

TABLE 1 - 1

SUMMARY OF WASTE DIVERTED QUANTITIES (1991)

SOURCE	QUANTITIES GENERATED TONS/YEAR	QUANTITIES DIVERTED TONS/YEAR	PERCENT DIVERSION
RESIDENTIAL	14,923	3,615	8.0%
COMMERCIAL/INDUSTRIAL	30,077	5,429	11.9%
SELF-HAUL	436		
TOTAL	45,436	9,044	19.9%

1.3.3 Recycling

Recycling is defined in AB939 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." In addition to conserving land disposal capacity, this form of waste diversion helps preserve natural resources and reduces the environmental impacts associated with waste disposal.

Short-term Planning Period

- Continue a residential curbside collection program for recyclables.
- Expand a multi-family dwelling program for recyclables.
- Increase participation (volume) of materials collected in the commercial/industrial recycling program.
- Continue a program to divert inert solids generated from public works and construction/demolition projects.
- Expand a program of regulatory approaches such as zoning, building codes, and land-use requirements to promote recycling activities.
- Continue a variable rate structure for both commercial and residential collection.
- Expand City sponsored programs aimed at recycling throughout City offices and operations.
- Continue a market development program through a local procurement program for products with recycled material content.
- Continue any multi-jurisdictional approaches to recycling such as public education, disposal fees, and market development.

Medium-term Planning Period

- Develop a mobile collection system for recyclables.
- Develop a drop-off center for recyclables.

1.3.4 Composting

Composting can be defined as the biological degradation of organic matter under controlled conditions to produce a usable soil amendment. Composting will be a major contribution to the City's goals of diverting solid waste from the landfill.

Short-term Planning Period

- Initiate a curbside residential yard waste collection program.
- Expand a drop-off program for yard waste at a landfill or other existing sites, focusing on self-haulers.
- Initiate a marketing program for the distribution of end-products.
- Disseminate public education and publicity materials regarding yard waste drop-off and curbside collection programs, home composting, and other yard waste reduction strategies.

Medium-term Planning Period

- Expand curbside residential yard waste collection for the commercial section.

1.3.5 Solid Waste Facility Capacity

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 City of Cupertino for the next 15 years.

Existing Permitted Solid Waste Disposal Facilities

There are no existing permitted solid waste disposal facilities within the City of Cupertino. The City currently exports all of its solid waste for disposal to a permitted solid waste disposal facility in the City of San Jose, Newby Island.

Existing Disposal Facility

The City's current contract with Newby Island together with achievement of the projected waste diversion goals, will provide adequate disposal capacity through 2018.

Disposal Capacity Needs Projection

The disposal facility capacity needs projection provides an estimate of the disposal capacity that is needed to accommodate projected solid waste for a 15-year period commencing in 1991.

Results of the solid waste disposal facility needs projection are shown in Table 1-2.

Disposal Facility Phase-out or Closure

The City's current contract with Newby Island landfill, together with achievement of the projected waste diversion goals, will provide adequate disposal capacity through 2018.

New or Expanded Disposal Facilities

There are no plans to establish a new disposal facility for the City of Cupertino during the planning period.

1.3.6 Public Education and Information

Education and public information is one of the most important components of AB939. There are many ways to increase public awareness of, and participation in, recycling, source reduction, and compositing projects. Educational media will include:

- Video Tapes
- Newsletters
- Participation in Special Events
- Information Distributed to Schools
- Placement of door-knob hangers/mass mailing

Short-term Planning Period

- Expand program that address solid waste management in general. Approach should be directed to residential, commercial, and industrial generators;
- Provide feedback to the public on the success of all implemented programs.
- In cooperation with local schools, develop educational materials for school age children.

TABLE 1 - 2

CITY OF CUPERTINO
SOLID WASTE DISPOSAL FACILITY CAPACITY NEEDS

	CONTINUATION OF CURRENT PROGRAM			IMPLEMENTATION OF SRRE		
YEAR	ANNUAL WASTE GENERATED	ANNUAL WASTE DIVERTED	ANNUAL WASTE DISPOSED	ANNUAL WASTE GENERATED	ANNUAL WASTE DIVERTED	ANNUAL WASTE DISPOSED
1990	51,593	8,800	42,793	51,593	8,800	42,793
1991	45,436	9,044	36,392	45,436	9,044	36,392
1992	46,663	9,274	37,389	46,663	13,658	33,005
1993	47,923	9,535	38,388	47,923	14,827	33,096
1994	49,169	9,783	39,386	49,169	15,817	33,352
1995	50,398	10,016	40,382	50,398	17,290	33,108
1996	50,599	10,063	40,536	50,599	18,926	31,673
1997	50,802	10,112	40,690	50,802	19,987	30,815
1998	51,005	10,161	40,844	51,005	22,015	28,990
1999	51,209	10,210	40,999	51,209	23,643	27,566
2000	51,388	10,233	41,155	51,388	25,938	25,450
2001	51,440	10,240	41,200	51,440	25,977	25,463
2002	51,491	10,245	41,246	51,491	26,003	25,488
2003	51,543	10,252	41,291	51,543	26,037	25,506
2004	51,594	10,257	41,337	51,594	26,055	25,539
2005	51,646	10,264	41,382	51,646	26,081	25,565

- Expand information for commercial and self-haul generators to explain various options for the disposal of construction and demolition debris.

- Develop educational materials that describe how to properly dispose of special waste.

- Expand materials to support the Household Hazardous Waste program.

Medium-term Planning Period

- Develop information about materials recovery facility, its functions, and services provided.

- Develop materials to support the various self-haul programs.

1.3.7 Funding

Solid waste management programs in the City of Cupertino are funded by the City's Resource Recovery Fund. Revenue for the Resource Recovery Fund comes from rates from refuse collection by Los Altos Garbage Co., the refuse collector for the City.

The source of funding for future programs during the short-term period in the City will be the City's Resource Recovery Fund.

Results of Annual Program Cost Estimates through 1995 are presented in Table 1-3.

1.3.8 Special Waste

Special waste is solid waste that requires unique handling and disposal methods because of health hazard, environmental impact, or physical characterizations.

Short-term Planning Period

- Continue to review the disposal of special waste.

- Review a program to divert tires from landfilling for ultimate end use.

- Continue a program to prohibit disposal of used tires at landfills.

- Continue a program to prohibit disposal of white goods at landfills.

1.3.9 Integration

Combination of existing and proposed source reduction, recycling, composting and environmentally safe transformation and disposal programs will contribute toward achieving the waste diversion goals.

Currently the City of Cupertino diverts an estimated 19.9 percent of its solid waste from the landfill. By 1995, the City projects a total diversion rate of 34 percent. By 2000, the City projects a total diversion rate of 50 percent.

Table 1 - 3

City of Cupertino Estimated Annual Costs, 1991 -1995

COMPONENT	ESTIMATED ANNUAL COST	CITY COST
SOURCE REDUCTION	$500	$500
RECYCLING	$267,000	$0
COMPOSTING	$600,000	$0
PUBLIC EDUCATION	$50,000	$50,000
SPECIAL WASTE	$500	$500
HOUSEHOLD HAZARDOUS WASTE	$50,000	$50,000
TOTAL	$968,000	$101,000

2. WASTE GENERATION STUDY

2.1 INTRODUCTION

This section presents the results of a waste characterization study performed for the City of Cupertino. As required by AB 939, the results of two studies are presented in this section, a waste disposal study and a waste diversion study. From the results of these two studies current and future waste generation disposal and diversion quantities were calculated and are presented in Tables 2-4 and 2-5. The results of the disposal and diversion characterization yield the total amount of solid waste generated in the City of Cupertino according to the following equation as defined by AB 939.

GEN = DISP + DIVERT

where **GEN** = the total quantity of solid waste generated within the jurisdiction.

DISP = the total quantity of solid waste, generated within the jurisdiction, which is transformed or disposed in permitted solid waste facilities.

DIVERT = 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.

2.2 WASTE DISPOSAL STUDY

Objective of Study

The objective of the waste disposal study is to determine the quantities of materials that are generated by the residential, commercial and self-haul segments in the City of Cupertino, and being disposed of by landfilling.

The quantities of waste generated in the City of Cupertino 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 Resource Recovery from June 3-12, 1991, as shown in Table 2-1.

Cal Recovery, Inc. was retained to plan and conduct a waste characterization study for the cities of Cupertino and Los Altos,

Town of Los Altos Hills, and portions of north Santa Clara County. The complete study by Cal Recovery, Inc. is attached at the end of this section.

Table 2-1

Planned and Actual Number of Vehicles Sampled for the City of Cupertino Disposed Waste Field Analysis (June 3-12, 1991)

WASTE SOURCE	PLANNED	ACTUAL
RESIDENTIAL	10	10
COMMERCIAL	8	8
INDUSTRIAL	6	7
TOTAL	24	25

Waste Collection and Disposal Practices

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

There is no permitted waste disposal facility in Cupertino. Most waste from the city is disposed of in San Jose.

Results

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 2-2. 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.

Figure 2-1 shows the percentage (by weight) of the jurisdiction's total disposed waste by waste source. As shown in the figure, the residential, commercial, and industrial waste sources all comprise approximately 1/3 of the total disposed waste stream.

In the following sections, the results of the disposed waste characterization are discussed as they pertain to the City of Cupertino.

TABLE 2 - 2

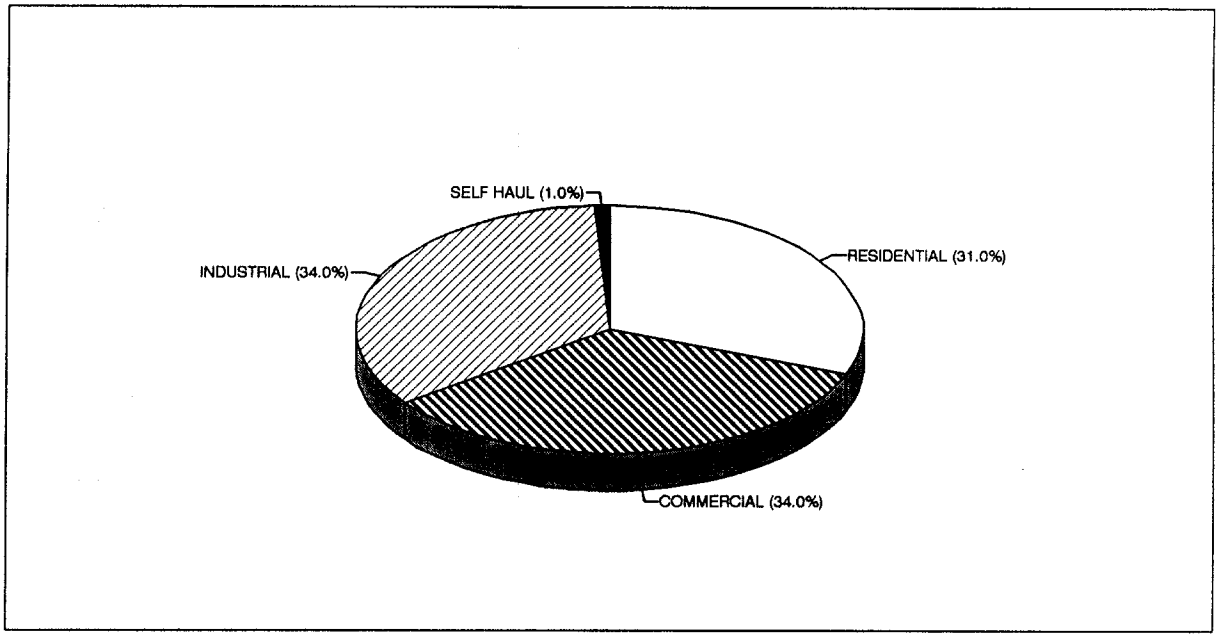
AVERAGE COMPOSITION (% WEIGHT) AND ANNUAL QUANTITIES (TONS/YEAR) OF DISPOSED WASTE

1991

		WASTE SOURCE									
		RESIDENTIAL N = 10		COMMERCIAL N = 8		INDUSTRIAL N = 7		SELF HAUL (VISUAL)		TOTAL DISPOSED	
	MATERIAL	%	TPY	%	TPY	%	TPY	%	TPY	%	TPY
1)	TOTAL PAPER	30.2	3410	43.7	5399	9.8	1199	3.1	14	27.5	10022
	OCC/ Kraft	6.0	678	15.5	1912	2.7	332	1.7	8	8.1	2930
	Mixed	12.6	1423	12.5	1547	2.1	255	1.2	5	8.9	3231
	Newspaper	3.1	349	6.6	822	0.2	28	0.1	0	3.3	1199
	High-Grade	0.4	45	0.9	112	0.8	103	0.0	0	0.7	260
	Other	8.1	915	8.1	1006	3.9	481	0.0	0	6.6	2402
2)	TOTAL PLASTICS	9.4	1067	8.5	1055	3.0	365	1.1	5	6.8	2492
	HDPE	1.1	127	0.9	106	0.1	11	0.0	0	0.7	244
	PET	0.2	26	0.2	19	0.0	3	0.0	0	0.1	47
	Film	4.1	467	4.6	563	1.4	168	0.6	2	3.3	1200
	Other	4.0	447	3.0	367	1.5	184	0.5	2	2.7	1001
3)	TOTAL GLASS	3.1	354	5.3	649	1.5	186	0.3	1	3.3	1190
	Refillable Beverage	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
	Cal Redemption	0.7	76	2.0	243	0.8	100	0.0	0	1.2	419
	Other Recyclable	2.4	267	3.0	374	0.4	50	0.0	0	1.9	691
	Other Non-recyl	0.1	10	0.3	33	0.3	35	0.2	1	0.2	80
4)	TOTAL METALS	3.3	368	3.7	458	7.6	939	4.0	17	4.9	1783
	Aluminum Cans	0.3	33	0.5	61	0.1	14	0.0	0	0.3	108
	Bimetal	0.0	2	0.0	0	0.0	0	0.0	0	0.0	2
	Tin F/B Cans	1.6	181	1.9	238	0.1	16	0.0	0	1.2	435
	Non-Fe	0.2	27	0.2	19	0.7	88	0.3	1	0.4	135
	White Goods	0.0	0	0.0	0	1.7	211	1.1	5	0.6	216
	Other	1.1	125	1.1	140	5.0	611	2.5	11	2.4	887
5)	YARD WASTE	30.6	3465	19.7	2433	12.9	1580	15.3	67	20.7	7545
6)	OTHER ORGANICS	20.9	2363	17.9	2217	24.5	3015	25.1	110	21.2	7705
	Food	10.7	1209	11.9	1470	3.1	384	0.2	1	8.4	3063
	Tires/Rubber	0.1	16	3.0	377	1.9	230	0.2	1	1.7	624
	Wood	2.2	248	1.2	148	15.0	1846	22.8	100	6.4	2341
	Ag. Crop Residue	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
	Manure	0.1	12	0.0	0	0.0	0	0.0	0	0.0	12
	Textile/Leather	2.3	261	0.4	45	0.2	23	1.4	6	0.9	336
	Othr Misc. Org.	5.5	617	1.4	178	4.3	533	0.6	2	3.7	1330
7)	OTHER WASTES	1.3	149	1.2	146	39.4	4847	51.1	223	14.7	5365
	Inerts	1.2	133	0.1	6	39.4	4846	51.0	223	14.3	5207
	HHW	0.1	16	1.1	140	0.0	2	0.1	0	0.4	158
8)	SPECIAL WASTES	1.2	132	0.0	0	1.3	158	0.1	0	0.8	290
	TOTAL	100.0	11308	100.0	12358	100.0	12290	100.0	436	100.0	36392

FIGURE 2-1

PERCENTAGE (BY WEIGHT) OF
TOTAL DISPOSED QUANTITIES BY WASTE SOURCE
CITY OF CUPERTINO
1991



Residential Wastes

Vehicles containing residential waste were sampled each day during the collection vehicle sample period. As shown in Table 2-2, yard waste is the category with the largest concentration (30.6%) in the disposed residential waste stream. The total paper category has the second largest concentration (30.2%); mixed paper alone comprises approximately 12.6% of the City's disposed residential waste. Food waste comprises 10.7% of this waste stream.

Commercial Wastes

Generators of commercial waste were sampled randomly from front and rear loaders. LAGCO personnel were available during the sampling program to provide assistance in determining load origin and route information regarding wastes from different sources in mixed loads.

The data in the table shows that 43.7% of the disposed commercial waste stream consists of paper products, with OCC/kraft and mixed paper having the largest concentrations in this category, at 15.5% and 12.5% of the disposed commercial waste stream respectively. The category with the largest concentration in the disposed commercial waste stream is yard waste, at 19.7%. Other organics comprise 17.9% of this waste stream; 11.9% is food wastes.

Industrial Wastes

The City of Cupertino does have industrial generators, e.g., Apple Computer. By CIWMB definition, industrial waste also includes material placed in debris boxes. Table 2 shows that 39.4% of the disposed industrial waste stream is in the category other wastes as inerts. The second largest concentration is the other organics category at 24.5% of the disposed industrial waste stream; 15.0% is wood wastes. The data shows that 12.9% of this waste stream is yard waste. A number of landscape contractors reported that they routinely place yard waste into debris boxes.

A total of 9.8% of disposal paper product is a relatively low figure since industrial generators in the city have developed excellent paper recycling programs.

Self-Haul Wastes

The quantity of self-haul wastes disposed is approximately 1% of the total disposed solid waste stream.

As shown in Table 2, the inerts waste type has the largest concentration (51.1%) in the disposed self-haul wastes. Wood and yard waste comprise 22.8% and 15.3% of this waste stream, respectively.

Seasonality

It has been assumed that four seasons could potentially impact the disposed wastes in the City of Cupertino. 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 Cupertino'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)[1], The City of Berkeley (1988/89), North Santa Clara County (NSCC) (1982/83)[2], and San Diego County (1988/89)[3]. 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 with +/-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 +/-20% of the average of the four seasons' (26%) projected disposed waste quantities.

Projected Disposed Waste Quantities

Fifteen-year projections of disposed wastes by waste source are shown in Table 2-3. The projected quantities are based on population projections provided by the City, published by the Association of Bay Area Governments (ABAG). The population projections are used only to calculate the escalation rate of the disposed waste quantities.

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1 "Solid Waste Characterization Study" study prepared by Cal Recovery Systems, Inc. for the City of San Francisco, 1987.

2 "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.

3 "Waste Characterization and Market Study", prepared for the County of San Diego by Recovery Sciences, Inc., 1989.

TABLE 2 - 3. PROJECTED ANNUAL QUANTITIES OF DISPOSED WASTES FOR CUPERTINO (TONS/YEAR)

Material	Year: / Esc factor a):	1991	1992 1.027	1993 1.027	1994 1.026	1995 1.025	1996 1.004	1997 1.004	1998 1.004	1999 1.004	2000 1.004	2001 1.001	2002 1.001	2003 1.001	2004 1.001	2005 1.001	2006 1.001
1) TOTAL PAPER		10022	10297	10572	10846	11121	11163	11206	11248	11291	11334	11346	11346	11371	11384	11396	11409
OCC/Kraft		2930	3010	3091	3171	3251	3264	3276	3289	3301	3314	3317	3317	3325	3328	3332	3336
Mixed Paper		3231	3319	3408	3497	3585	3599	3612	3626	3640	3654	3658	3658	3666	3670	3674	3678
Newsprint		1199	1232	1265	1298	1331	1336	1341	1346	1351	1356	1358	1358	1361	1362	1364	1365
High Grade		260	267	247	282	289	290	291	292	293	294	295	295	295	296	296	296
Other Paper		2402	2468	2533	2599	2665	2675	2685	2696	2706	2716	2719	2722	2725	2728	2731	2734
2) TOTAL PLASTICS		2492	2560	2628	2697	2765	2776	2786	2797	2807	2818	2821	2824	2827	2830	2834	2837
HDPE		244	251	257	264	271	272	273	274	275	276	276	277	277	277	278	278
PET		47	49	50	51	52	53	53	53	53	53	54	54	54	54	54	54
Film		1200	1233	1266	1299	1331	1336	1342	1347	1352	1357	1358	1360	1361	1363	1364	1366
Other Plastics		1001	1028	1055	1083	1110	1115	1119	1123	1127	1132	1133	1134	1135	1137	1138	1139
3) TOTAL GLASS		1190	1223	1255	1288	1320	1325	1331	1336	1341	1346	1347	1349	1350	1352	1353	1355
Refillable Beverage		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cal Redemption		419	431	442	454	465	467	469	471	472	474	475	475	476	476	477	477
Other Recyclable		691	710	729	748	767	770	773	776	778	781	782	783	784	785	786	787
Other Non Recyclable		80	82	84	86	88	89	89	89	90	90	90	90	90	90	91	91
4) TOTAL METALS		1783	1831	1880	1929	1978	1986	1993	2001	2008	2016	2018	2020	2023	2025	2027	2029
Aluminum Cans		108	111	114	117	120	120	120	121	121	122	122	122	122	122	123	123
Bimetal Cans		2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3
Tin F/B Cans		435	447	459	471	483	485	487	489	490	492	493	493	494	494	495	496
Non-Fe/Other Alum		135	138	142	146	149	150	151	151	152	152	153	153	153	153	153	153
White Goods		216	222	227	233	239	240	241	242	243	244	244	244	245	245	245	245
Other Metal		887	911	935	960	984	988	992	995	999	1003	1004	1005	1006	1007	1008	1010
5) YARD WASTES		7545	7752	7959	8166	8372	8404	8436	8468	8500	8533	8542	8551	8561	8570	8580	8589
6) OTHER ORGANICS		7705	7916	8127	8339	8550	8582	8815	8647	8680	8713	8723	8732	8742	8752	8761	8771
Food		3063	3147	3231	3315	3398	3411	3424	3437	3450	3464	3467	3471	3475	3479	3483	3486
Tires/Rubber		624	641	658	675	692	695	697	700	702	705	706	707	707	708	709	710
Wood		2341	2405	2469	2534	2598	2608	2617	2627	2637	2647	2650	2653	2656	2659	2662	2665
Ag. Crop Residue		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Manure		12	12	12	13	13	13	13	13	13	13	13	132	13	13	13	13
Textiles/Leather		336	345	354	363	372	374	375	377	378	379	380	380	381	381	382	382
Other Misc. Organics		1330	1367	1403	1440	1476	1482	1488	1493	1499	1505	1506	1508	1510	1511	1513	1515
7) OTHER WASTES		5365	5512	5660	5807	5954	5976	5999	6022	6045	6068	6074	6081	6088	6094	6101	6108
Inert Solids		5207	5350	5493	5635	5778	5800	5822	5844	5866	5889	5895	5902	5908	5915	5921	5928
HHW		158	163	167	171	176	176	177	178	178	179	179	179	180	180	180	180
8) OTHER SPECIAL WASTES b		290	298	306	314	322	323	325	326	327	328	329	329	329	330	330	331
Total		36392	37389	38388	39386	40382	40536	40690	40844	40999	41155	41200	41246	41291	41337	41382	41428

a) Escalation factor (Esc. factor) is based on projected population data, as reported by ABAG

b) Small Household Appliance

2.3 SOLID WASTE DIVERSION CHARACTERIZATION

Objective of the Study

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 City of Cupertino 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 material collected by the city's franchised hauler, Los Altos Garbage Co. (LAGCO), is brought to BFI Recyclery in San Jose.

There is no permitted solid waste diversion facility in Cupertino.

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, material 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 these materials into recycled products.

Much of the recycling in the City of Cupertino 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 City in 1990. Waste diversion data were obtained by the following mechanisms: (1) a mail survey of collectors and processors of recyclable materials, utilizing a material flow methodology; (2) a survey of City residential and nonresidential diversion programs; 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.

Survey of Recyclers. In order to document the quantity and types of materials that were diverted from disposal in the City 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 the 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

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 City.

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 D. Source reduction data for diapers were calculated using a conversion factor from a document entitled, "Diapers in the Waste Stream". 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 lbs
Mattress	40 lbs
Laser toner cartridge	4 lbs. (empty)

Breakdown of Data by Program

Residential Recycling. Based on the survey of recyclers and on the City's recycling programs, an estimated 3,615 tons of wastes are diverted in the City through residential recycling programs. These programs include residential curbside recycling, 3,381 tons; AB 20/20 (California redemption) programs, 201 tons; drop-off, 33 tons; and city offices, 11 tons.

Commercial/Industrial Recycling. The estimated quantity of solid wastes diverted by commercial/industrial recycling in 1991 was 5,429 tons.

Calculation of Diversion Rate

Diversion by waste type for the City is presented in Tables 2-6 and 2-7; 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]

Table 2-8 shows the 15-year projection of the quantity of wastes disposed, diverted, and generated by waste category and waste type.

Diversion Program

In the City of Cupertino, data from the following recycling programs contributed to the waste diversion study:

- a curbside co-mingled collection program for recyclables
- carbboard drop-off collection program
- city-sponsored office paper collection program
- city service center program to recycle oil, copper, steel, aluminum, brass, cardboard
- three California redemption centers
- Christmas tree collection
- telephone book collection
- independent recyclers diverting source separated paper, glass, metals, and other organic material from large industries

Reporting Procedures

Description of Data	Source of Information
Disposal - quantity of refuse disposed by LAGCO at the Newby Island Landfill	BFI and LAGCO monthly reports
Curbside collection of recyclables	LAGCO monthly reports
Cardboard drop-off collection program	LAGCO quarterly reports
City-sponsored office paper collection program	LAGCO quarterly reports

Description of Data	Source of Information
City-sponsored recycling program	City quarterly reports
California redemption centers	State yearly report
Christmas tree collection	LAGCO yearly report
Telephone book collection	LAGCO yearly report
Large business/industries source separated recycling program	Business quarterly reports
Commercial recycle collection	LAGCO quarterly reports

TABLE 2 - 4

PROJECTION OF DISPOSED AND DIVERTED QUANTITIES
ASSUMING CONTINUATION OF CURRENT PROGRAMS

YEAR	PROJECTED GROWTH RATE (%)	ANNUAL WASTE GENERATED (TONS)	ANNUAL WASTE DIVERTED FROM LANDFILLING (TONS)	WASTE DIVERTED (%)	TOTAL ANNUAL REFUSE DISPOSED (TONS)	TOTAL ANNUAL REFUSE DISPOSED (CUBIC YARDS)
1990	BASE	51,593	8,800	17.1%	42,793	171,172
1991	2.7%	45,436	9,044	19.9%	36,392	145,568
1992	2.7%	46,663	9,274	19.9%	37,389	149,556
1993	2.7%	47,923	9,535	19.9%	38,388	153,552
1994	2.6%	49,169	9,783	19.9%	39,386	157,544
1995	2.5%	50,398	10,016	19.9%	40,382	161,528
1996	0.4%	50,599	10,063	19.9%	40,536	162,144
1997	0.4%	50,802	10,112	19.9%	40,690	162,760
1998	0.4%	51,005	10,161	19.9%	40,844	163,376
1999	0.4%	51,209	10,210	19.9%	40,999	163,996
2000	0.4%	51,388	10,233	19.9%	41,155	164,620
2001	0.1%	51,440	10,240	19.9%	41,200	164,800
2002	0.1%	51,491	10,245	19.9%	41,246	164,984
2003	0.1%	51,543	10,252	19.9%	41,291	165,164
2004	0.1%	51,594	10,257	19.9%	41,337	165,348
2005	0.1%	51,646	10,264	19.9%	41,382	165,528

TABLE 2 - 5

PROJECTION OF DISPOSED AND DIVERTED QUANTITIES
ASSUMING CONTINUATION IMPLEMENTATION OF THE SRRE

YEAR	PROJECTED GROWTH RATE (%)	ANNUAL WASTE GENERATED (TONS)	ANNUAL WASTE DIVERTED FROM LANDFILLING (TONS)	WASTE DIVERTED (%)	TOTAL ANNUAL REFUSE DISPOSED (TONS)	TOTAL ANNUAL REFUSE DISPOSED (CUBIC YARDS)
1990	BASE	51,593	8,800	17.1%	42,793	171,172
1991	2.7%	45,436	9,044	19.9%	36,392	145,568
1992	2.7%	46,663	13,658	29.3%	33,005	132,020
1993	2.7%	47,923	14,827	30.9%	33,096	132,384
1994	2.6%	49,169	15,817	32.2%	33,352	133,408
1995	2.5%	50,398	17,290	34.3%	33,108	132,432
1996	0.4%	50,599	18,926	37.4%	31,673	126,692
1997	0.4%	50,802	19,987	39.3%	30,815	123,260
1998	0.4%	51,005	22,015	43.2%	28,990	115,960
1999	0.4%	51,209	23,643	46.2%	27,566	110,264
2000	0.4%	51,388	25,938	50.5%	25,450	101,800
2001	0.1%	51,440	25,977	50.5%	25,463	101,852
2002	0.1%	51,491	26,003	50.5%	25,488	101,952
2003	0.1%	51,543	26,037	50.5%	25,506	102,024
2004	0.1%	51,594	26,055	50.5%	25,539	102,156
2005	0.1%	51,646	26,081	50.5%	25,565	102,260

Table 2 - 6 RESIDENTIAL DIVERSION QUANTITIES

(Tons, 1991)

	SOURCE REDUCTION	CURBSIDE	APARTMENT RECYCLING	DROP-OFF (a)	BUY-BACK	20/20 CENTERS	COMPOSTING	TOTAL WITHOUT TRANSFORMATION	TRANS-FORMATION	TOTAL WITH TRANSFORMATION
PAPER	0.0	2419.0	0.0	0.0	0.0	0.0	0.0	2419.0	0.0	2419.0
corrugated containers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
newspaper	0.0	2419.0	0.0	0.0	0.0	0.0	0.0	2419.0	0.0	2419.0
high grade ledger paper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
mixed paper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
other paper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PLASTICS	0.0	51.0	0.0	0.0	0.0	13.0	0.0	64.0	0.0	64.0
HDPE containers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PET containers	0.0	51.0	0.0	0.0	0.0	13.0	0.0	64.0	0.0	64.0
film plastics	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
GLASS	0.0	602.0	0.0	0.0	0.0	152.0	0.0	754.0	0.0	754.0
refillable bev. containers	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	482.0	0.0	0.0	0.0	152.0	0.0	634.0	0.0	634.0
other recyclable glass	0.0	120.0	0.0	0.0	0.0	0.0	0.0	120.0	0.0	120.0
other non-recyclable glass	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
METALS	0.0	195.0	0.0	0.0	0.0	36.0	0.0	231.0	0.0	231.0
aluminum cans	0.0	156.0	0.0	0.0	0.0	36.0	0.0	192.0	0.0	192.0
bi-metal containers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
tin cans	0.0	39.0	0.0	0.0	0.0	0.0	0.0	39.0	0.0	39.0
other ferrous	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
other non-ferrous	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YARD WASTE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OTHER ORGANICS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
food waste	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
wood wastes	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
manure	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
diapers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
other misc. organics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OTHER WASTES	0.0	114.0	0.0	33.0	0.0	0.0	0.0	147.0	0.0	147.0
inert solids	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
batteries (b)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
oil (b)	0.0	114.0	0.0	0.0	0.0	0.0	0.0	114.0	0.0	114.0
other HHW's	0.0	0.0	0.0	33.0	0.0	0.0	0.0	33.0	0.0	33.0
SPECIAL WASTES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ash	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
industrial sludge	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
auto shredder waste	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
mattresses	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
other special waste	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	3381.0	0.0	33.0	0.0	201.0	0.0	3615.0	0.0	3615.0

(a) Includes non-profit recycling activities.

(b) Considered Household Hazardous Wastes (HHW).

Table 2 - 7 COMMERCIAL/INDUSTRIAL DIVERSION QUANTITIES

(Tons, 1991)

	SOURCE REDUCTION	CITY PROGRAMS	PRIVATE COMMERCIAL	PRIVATE INDUSTRIAL	LANDFILL SALVAGING	COMPOSTING	TOTAL WITHOUT TRANSFORMATION	TRANS-FORMATION	TOTAL WITH TRANSFORMATION
PAPER	0.0	11.0	55.6	2973.0	0.0	0.0	3039.6	0.0	3039.6
corrugated containers	0.0	0.0	41.4	1683.0	0.0	0.0	1724.4	0.0	1724.4
newspaper	0.0	0.0	0.0	41.0	0.0	0.0	41.0	0.0	41.0
high grade ledger paper	0.0	0.0	14.2	128.0	0.0	0.0	142.2	0.0	142.2
mixed paper	0.0	11.0	0.0	1100.0	0.0	0.0	1111.0	0.0	1111.0
other paper	0.0	0.0	0.0	21.0	0.0	0.0	21.0	0.0	21.0
PLASTICS	0.0	0.0	0.0	16.0	0.0	0.0	16.0	0.0	16.0
HDPE containers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PET containers	0.0	0.0	0.0	16.0	0.0	0.0	16.0	0.0	16.0
film plastics	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
GLASS	0.0	0.0	14.1	298.0	0.0	0.0	312.1	0.0	312.1
refillable bev. containers	0.0	0.0	6.1	224.0	0.0	0.0	230.1	0.0	230.1
CA Redemption Value	0.0	0.0	7.0	0.0	0.0	0.0	7.0	0.0	7.0
other recyclable glass	0.0	0.0	1.0	74.0	0.0	0.0	75.0	0.0	75.0
other non-recyclable glass	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
METALS	0.0	0.0	19.7	811.0	0.0	0.0	830.7	0.0	830.7
aluminum cans	0.0	0.0	0.0	16.0	0.0	0.0	16.0	0.0	16.0
bi-metal containers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
tin cans	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
other ferrous	0.0	0.0	15.0	795.0	0.0	0.0	810.0	0.0	810.0
other aluminum	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	1.0	0.0	0.0	0.0	1.0	0.0	1.0
white goods	0.0	0.0	3.7	0.0	0.0	0.0	3.7	0.0	3.7
YARD WASTE	0.0	0.0	55.0	81.0	0.0	0.0	136.0	0.0	136.0
OTHER ORGANICS	0.0	0.0	195.0	900.0	0.0	0.0	1095.0	0.0	1095.0
food waste	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
tires/rubber	0.0	0.0	28.4	0.0	0.0	0.0	28.4	0.0	28.4
wood wastes	0.0	0.0	166.6	900.0	0.0	0.0	1066.6	0.0	1066.6
agricultural crop residues	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
textiles/leather	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
diapers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
other misc. organics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OTHER WASTES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
inert solids	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
batteries (a)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
oil (a)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
other HHW's	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SPECIAL WASTES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ash	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
industrial sludge	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
auto shredder waste	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
mattresses	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
other special waste	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	11.0	339.4	5079.0	0.0	0.0	5429.4	0.0	5429.4

(a) Considered Household Hazardous Wastes (HHW).

Materials Targeted for Diversion

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 bev. cans

Plastics:
- polystyrene
- PET containers
- HDPE 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 (e.g., asphalt, concrete, and soil)

Materials Targeted for Disposal

The following list identifies the materials that are currently being disposed of in the City that will not be diverted from disposal by the programs identified in this SRRE. The programs identified in the SRRE do not target the following list of materials because (1) the materials are nonrecyclable, (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 nonrecyclable glass

Plastics:
- film plastics
- other plastics

Other organics:
- food waste

Materials Targeted for Diversion

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

Plastics:
- polystyrene
- PET containers
- HDPE containers

Glass:
- CA Redemption Value
- other recyclable glass
- refillable beverage containers

Metals:
- aluminum cans
- other ferrous
- non-ferrous, incl. alum. scrap
- bi-metal containers
- white goods
- steel food and bev. cans

Other organics:
- yard waste
- tires/rubber
- wood wastes
- textiles/leather

Other wastes:
- inert solids (e.g., asphalt, concrete, and soil)

Materials Targeted for Disposal

The following list identifies the materials that are currently being disposed of in the City that will not be diverted from disposal by the programs identified in this SRRE. The programs identified in the SRRE do not target the following list of materials because (1) the materials are nonrecyclable, (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

Plastics:
- film plastics
- other plastics

Glass:
- other nonrecyclable glass

Other organics:
- food waste

TABLE 2 - 8

WASTE GENERATION PROJECTION WITH SRRE

Material	1991			1992			1993			1994			1995		
	DISP	DIV	GEN	DISP	DIV	GEN	DISP	DIV	GEN	DISP	DIV	GEN	DISP	DIV	GEN
1) TOTAL PAPER	10022	5458	15480	10042	5856	15898	10072	6256	16327	10097	6654	16752	10117	7053	17171
OCC/Kraft	2930	1724	4654	2884	1896	4780	2841	2068	4909	2796	2240	5036	2750	2412	5162
Mixed Paper	3231	1111	4342	3193	1266	4459	3159	1421	4580	3123	1576	4699	3084	1732	4816
Newsprint	1199	2460	3659	1231	2526	3758	1265	2595	3859	1298	2662	3960	1330	2729	4059
High Grade	260	142	402	267	146	413	274	150	424	281	154	435	288	158	446
Other Paper	2402	21	2423	2467	22	2488	2533	22	2556	2599	23	2622	2664	23	2688
2) TOTAL PLASTICS	2492	80	2572	2559	82	2641	2628	84	2713	2697	87	2783	2664	189	2853
HDPE	244	0	244	251	0	251	257	0	257	264	0	264	171	100	271
PET	47	80	127	48	82	130	50	84	134	51	87	137	52	89	141
Film	1200	0	1200	1232	0	1232	1266	0	1266	1299	0	1299	1331	0	1331
Other Plastics	1001	0	1001	1028	0	1028	1056	0	1056	1083	0	1083	1110	0	1110
3) TOTAL GLASS	1190	1066	2256	1155	1162	2317	1122	1258	2379	1088	1354	2441	1053	1449	2502
Refillable Beverage	0	230	230	0	236	236	0	243	243	0	249	249	0	255	255
Cal Redemption	419	641	1060	430	658	1089	442	676	1118	453	694	1147	465	711	1176
Other Recyclable	691	195	886	643	267	910	595	339	934	548	411	959	500	483	983
Other Non Recyclable	80	0	80	82	0	82	84	0	84	87	0	87	89	0	89
4) TOTAL METALS	1783	1062	2845	1781	1141	2922	1781	1220	3001	1780	1299	3079	1778	1378	3156
Aluminum Cans	108	208	316	111	214	325	114	219	333	117	225	342	120	231	351
Bimetal Cans	2	0	2	2	0	2	2	0	2	2	0	2	2	0	2
Tin F/B Cans	435	39	474	397	90	487	359	141	500	321	192	513	283	243	526
Non-Fe/Other Alum	135	810	945	139	832	971	142	854	997	146	877	1023	150	898	1048
White Goods	216	4	220	222	4	226	228	4	232	234	4	238	240	4	244
Other Metal	887	1	888	911	1	912	936	1	937	960	1	961	984	1	985
5) YARD WASTES	7545	136	7681	5338	2550	7888	5426	2675	8101	5637	2675	8312	5846	2674	8520
6) OTHER ORGANICS	7705	1095	8800	7789	1249	9038	7878	1404	9282	7965	1558	9523	8048	1713	9761
Food	3063	0	3063	3146	0	3146	3231	0	3231	3315	0	3315	3397	0	3397
Tires/Rubber	624	28	652	641	29	670	658	30	688	675	30	706	692	31	723
Wood	2341	1066	3407	2279	1220	3499	2219	1374	3593	2159	1528	3687	2097	1682	3779
Ag. Crop Residue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Manure	12	0	12	12	0	12	13	0	13	13	0	13	13	0	13
Textiles/Leather	336	0	336	345	0	345	354	0	354	364	0	364	373	0	373
Other Misc. Organics	1330	0	1330	1366	0	1366	1403	0	1403	1439	0	1439	1475	0	1475
7) OTHER WASTES	5365	147	5512	4042	1619	5661	3883	1931	5814	3775	2190	5965	3280	2834	6114
Inert Solids	5207	0	5207	3880	1468	5348	3716	1776	5492	3604	2031	5635	3105	2671	5776
HHW	158	147	305	162	151	313	167	155	322	171	159	330	175	163	338
8) OTHER SPECIAL WASTE	290	0	290	298	0	298	306	0	306	314	0	314	322	0	322
Total	36392	9044	45436	33005	13658	46663	33096	14827	47923	33352	15817	49169	33108	17290	50398
PERCENT DIVERSION		19.90%			29.27%			30.94%			32.17%			34.31%	

TABLE 2 - 8 (CONTINUED)

Material	1996			1997			1998			1999			2000		
	DISP	DIV	GEN	DISP	DIV	GEN	DISP	DIV	GEN	DISP	DIV	GEN	DISP	DIV	GEN
1) TOTAL PAPER	9896	7343	17239	9654	7654	17308	8948	8429	17377	8437	9010	17447	7787	9721	17508
OCC/Kraft	2672	2511	5183	2586	2617	5204	2342	2882	5224	2164	3081	5245	1940	3324	5264
Mixed Paper	3032	1803	4835	2975	1879	4855	2804	2070	4874	2681	2212	4894	2524	2387	4911
Newsprint	1234	2841	4075	1130	2961	4091	847	3261	4107	638	3486	4124	378	3761	4138
High Grade	284	164	448	279	171	449	263	188	451	252	201	453	238	217	455
Other Paper	2674	24	2698	2684	25	2709	2692	28	2720	2701	30	2731	2708	32	2740
2) TOTAL PLASTICS	2668	196	2864	2671	205	2876	2662	226	2887	2658	241	2899	2649	260	2909
HDPE	168	104	272	164	109	273	154	120	274	147	128	275	138	138	276
PET	49	92	141	46	96	142	37	106	143	30	113	143	21	122	144
Film	1336	0	1336	1342	0	1342	1347	0	1347	1352	0	1352	1357	0	1357
Other Plastics	1115	0	1115	1119	0	1119	1124	0	1124	1128	0	1128	1132	0	1132
3) TOTAL GLASS	1005	1508	2512	949	1573	2522	800	1732	2533	692	1851	2543	555	1997	2552
Refillable Beverage	0	256	256	0	257	257	0	258	258	0	259	259	0	260	260
Cal Redemption	431	749	1180	393	792	1185	293	897	1190	220	975	1195	128	1071	1199
Other Recyclable	484	503	987	467	524	991	417	577	995	382	617	999	336	666	1002
Other Non Recyclable	89	0	89	89	0	89	90	0	90	90	0	90	90	0	90
4) TOTAL METALS	1735	1434	3168	1686	1495	3181	1547	1646	3194	1447	1760	3206	1319	1899	3218
Aluminum Cans	112	240	352	103	250	353	79	276	355	61	295	356	39	318	357
Bimetal Cans	2	0	2	2	0	2	2	0	2	2	0	2	2	0	2
Tin F/B Cans	275	253	528	266	264	530	242	290	532	224	310	534	201	335	536
Non-Fe/Other Alum	152	900	1052	147	910	1057	141	920	1061	135	930	1065	129	940	1069
White Goods	240	5	245	241	5	246	242	5	247	242	6	248	243	6	249
Other Metal	953	36	989	927	66	993	842	155	997	782	219	1001	704	300	1004
5) YARD WASTES	4846	3708	8554	4463	4125	8588	4076	4546	8622	3686	4971	8657	2893	5794	8687
6) OTHER ORGANICS	8017	1783	9800	7980	1859	9839	7831	2047	9879	7730	2188	9918	7592	2361	9953
Food	3411	0	3411	3425	0	3425	3438	0	3438	3452	0	3452	3464	0	3464
Tires/Rubber	694	32	726	695	34	729	695	37	732	695	40	735	695	43	737
Wood	2043	1751	3794	1984	1825	3809	1814	2010	3825	1691	2149	3840	1535	2318	3853
Ag. Crop Residue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Manure	13	0	13	13	0	13	13	0	13	14	0	14	14	0	14
Textiles/Leather	374	0	374	376	0	376	377	0	377	379	0	379	380	0	380
Other Misc. Organics	1481	0	1481	1487	0	1487	1493	0	1493	1499	0	1499	1504	0	1504
7) OTHER WASTES	3188	2951	6138	3088	3075	6163	2801	3387	6188	2592	3620	6212	2328	3906	6234
Inert Solids	3018	2781	5799	2924	2898	5822	2653	3192	5845	2457	3412	5869	2208	3681	5889
HHW	170	170	340	164	177	341	148	195	342	135	208	344	120	225	345
8) OTHER SPECIAL WASTE	323	0	323	324	0	324	326	0	326	327	0	327	328	0	328
Total	31673	18926	50599	30815	19987	50802	28990	22015	51005	27566	23643	51209	25450	25938	51388
PERCENT DIVERSION		37.40%			39.34%			43.16%			46.17%			50.47%	

TABLE 2 - 8 (CONTINUED)

Material	2001			2002			2003			2004			2005		
	DISP	DIV	GEN	DISP	DIV	GEN	DISP	DIV	GEN	DISP	DIV	GEN	DISP	DIV	GEN
1) TOTAL PAPER	7781	9744	17525	7744	9799	17543	7707	9854	17561	7718	9860	17578	7723	9872	17596
OCC/Kraft	1937	3332	5269	1923	3351	5274	1910	3370	5280	1913	3372	5285	1914	3376	5290
Mixed Paper	2523	2393	4916	2514	2406	4921	2506	2420	4926	2509	2421	4930	2511	2424	4935
Newsprint	373	3770	4142	356	3791	4147	339	3812	4151	341	3814	4155	340	3819	4159
High Grade	238	218	455	237	219	456	236	220	456	236	220	456	236	220	457
Other Paper	2711	32	2743	2714	32	2746	2716	33	2749	2719	33	2751	2722	33	2754
2) TOTAL PLASTICS	2651	261	2912	2653	262	2915	2654	264	2918	2657	264	2921	2659	264	2924
HDPE	138	138	276	138	139	277	137	140	277	137	140	277	137	140	277
PET	21	123	144	21	123	144	20	124	144	20	124	144	20	124	144
Film	1359	0	1359	1360	0	1360	1361	0	1361	1363	0	1363	1364	0	1364
Other Plastics	1133	0	1133	1134	0	1134	1136	0	1136	1137	0	1137	1138	0	1138
3) TOTAL GLASS	553	2001	2554	543	2014	2557	535	2024	2559	537	2025	2562	536	2029	2564
Refillable Beverage	0	260	260	0	261	261	0	261	261	0	261	261	0	261	261
Cal Redemption	126	1074	1200	119	1082	1201	114	1088	1202	115	1089	1204	114	1091	1205
Other Recyclable	336	667	1003	333	671	1004	330	675	1005	331	675	1006	331	676	1007
Other Non Recyclable	91	0	91	91	0	91	91	0	91	91	0	91	91	0	91
4) TOTAL METALS	1317	1904	3221	1310	1914	3224	1302	1925	3227	1305	1926	3231	1305	1929	3234
Aluminum Cans	39	319	358	38	321	358	36	322	358	36	323	359	36	323	359
Bimetal Cans	2	0	2	2	0	2	2	0	2	2	0	2	2	0	2
Tin F/B Cans	201	336	537	200	338	537	198	339	538	199	340	538	199	340	539
Non-Fe/Other Alum	128	942	1070	123	948	1071	119	953	1072	120	953	1073	120	955	1074
White Goods	243	6	249	243	6	249	243	6	250	244	6	250	244	6	250
Other Metal	705	301	1005	704	302	1006	703	304	1007	704	304	1008	705	305	1009
5) YARD WASTES	2912	5784	8696	3008	5697	8705	3095	5618	8713	3098	5624	8722	3107	5624	8731
6) OTHER ORGANICS	7596	2367	9963	7593	2380	9973	7590	2393	9983	7598	2395	9993	7605	2398	10003
Food	3468	0	3468	3471	0	3471	3475	0	3475	3478	0	3478	3482	0	3482
Tires/Rubber	695	43	738	696	43	739	696	43	740	697	43	740	698	43	741
Wood	1534	2324	3857	1524	2337	3861	1515	2350	3865	1518	2351	3869	1518	2354	3873
Ag. Crop Residue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Manure	14	0	14	14	0	14	14	0	14	14	0	14	14	0	14
Textiles/Leather	380	0	380	381	0	381	381	0	381	382	0	382	382	0	382
Other Misc. Organics	1506	0	1506	1507	0	1507	1509	0	1509	1510	0	1510	1512	0	1512
7) OTHER WASTES	2325	3915	6240	2309	3937	6247	2294	3959	6253	2297	3962	6259	2299	3967	6265
Inert Solids	2205	3690	5895	2190	3711	5901	2175	3731	5907	2179	3734	5913	2180	3739	5919
HHW	120	225	345	119	227	346	118	228	346	118	228	346	118	228	347
8) OTHER SPECIAL WASTE	328	0	328	329	0	329	329	0	329	329	0	329	330	0	330
Total	25463	25977	51440	25488	26003	51491	25506	26037	51543	25539	26055	51594	25565	26081	51646
PERCENT DIVERSION		50.50%			50.50%			50.52%			50.50%			50.50%	

Report 1301

Final

DISPOSED WASTE CHARACTERIZATION STUDY
FOR
CITY OF CUPERTINO

Submitted to:

Santa Clara County

by:

CalRecovery Inc.
725C Alfred Nobel Drive
Hercules, California 94547

September 1991

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DISPOSED WASTE CHARACTERIZATION STUDY

INTRODUCTION

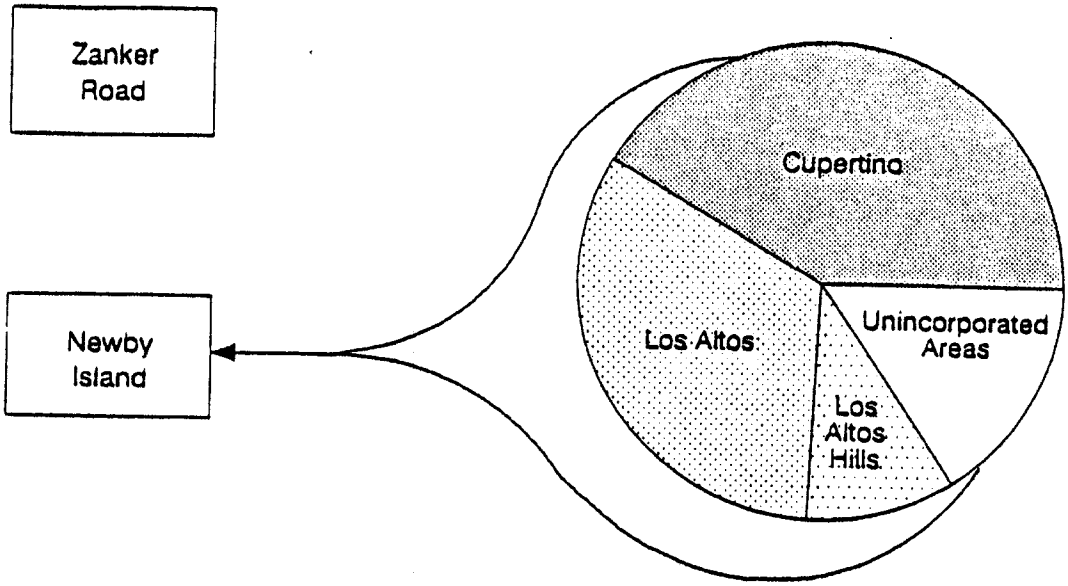
The California Integrated Waste Management Act, Assembly Bill 939, requires local governments to reduce, reuse, recycle, and compost a portion of the materials that are typically disposed by their jurisdictions. The State has mandated that 25% and 50% solid waste diversion rates be met in 1995 and 2000, 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

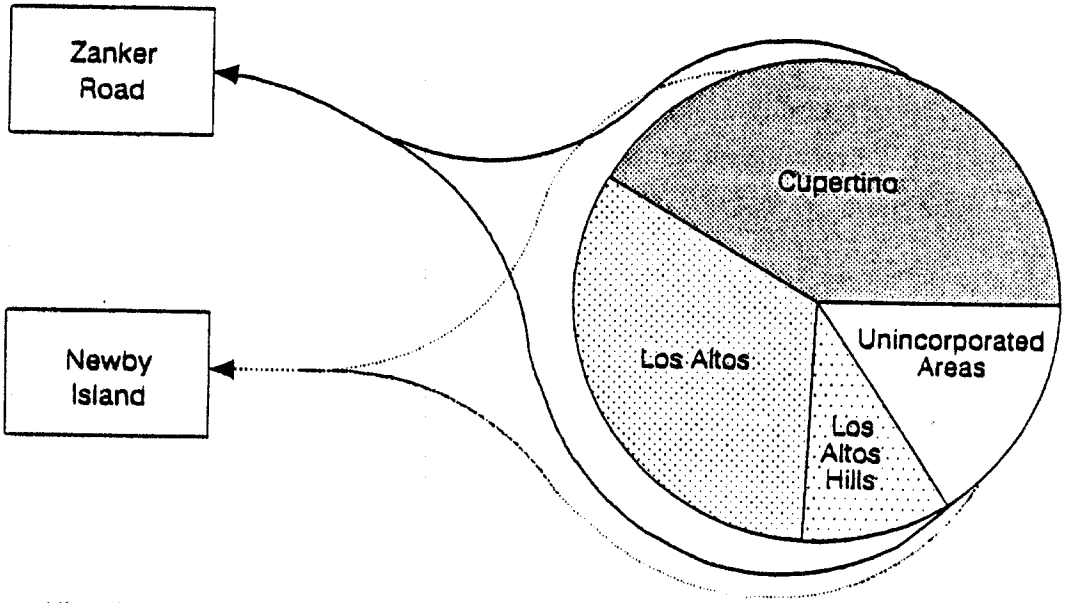
The cities of Cupertino and Los Altos, and the Town of Los Altos Hills have recently agreed to long-term (30-year) disposal contracts with BFI for disposal at Newby Island Landfill (see Figure 1a). Each of the disposal agreements provides for disposal of wastes generated within the



——— 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.

ACCURACY STATEMENT

The sampling program for disposed waste analysis was designed to achieve composition results that would be within ±10% to 15% of the population mean (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/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 <u>total</u> paper average compositions (x) and standard deviations (s), as determined in the October 1990 waste characterization study for the City

of Sunnyvale[1] (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:

$$n = \left[\frac{1.684 \ (0.3)}{0.15} \right]^2$$

$$n \simeq 12$$

using t^*_{90} (n=12) through substitution:

$$n = \left[\frac{1.7959 \ (0.3)}{0.15} \right]^2$$

$$n \simeq 13$$

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.

[1] "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
TOTALS	24	25	24	25	16	13	16	17	80	80

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.

RESULTS

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.

Cupertino
June 3-12, 1991
Disposed Waste Characterization

Material	Residential N = 10 %	Residential N = 10 TPY	Commercial N = 8 %	Commercial N = 8 TPY	Industrial N = 7 %	Industrial N = 7 TPY	Self Haul (Visual) %	Self Haul (Visual) TPY	Total Disposed %	Total Disposed TPY
1) TOTAL PAPER	30.2	3410	43.7	5399	9.8	1199	3.1	14	27.5	10022
OCC/Kraft	6.0	678	15.5	1912	2.7	332	1.7	8	8.1	2930
Mixed	12.6	1423	12.5	1547	2.1	255	1.2	5	8.9	3231
Newspaper	3.1	349	6.6	822	0.2	28	0.1	0	3.3	1199
High-Grade	0.4	45	0.9	112	0.8	103	0.0	0	0.7	260
Other	8.1	915	8.1	1006	3.9	481	0.0	0	6.6	2402
2) TOTAL PLASTICS	9.4	1067	8.5	1055	3.0	365	1.1	5	6.8	2492
HDPE	1.1	127	0.9	106	0.1	11	0.0	0	0.7	244
PET	0.2	26	0.2	19	0.0	3	0.0	0	0.1	47
Film	4.1	467	4.6	563	1.4	168	0.6	2	3.3	1200
Other	4.0	447	3.0	367	1.5	184	0.5	2	2.7	1001
3) TOTAL GLASS	3.1	354	5.3	649	1.5	186	0.3	1	3.3	1190
Refillable Beverage	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Cal Redemption	0.7	76	2.0	243	0.8	100	0.0	0	1.2	419
Other Recyclable	2.4	267	3.0	374	0.4	50	0.0	0	1.9	691
Other Non-Recycl	0.1	10	0.3	33	0.3	35	0.2	1	0.2	80
4) TOTAL METALS	3.3	368	3.7	458	7.6	939	4.0	17	4.9	1783
Aluminum Cans	0.3	33	0.5	61	0.1	14	0.0	0	0.3	108
Bimetal	0.0	2	0.0	0	0.0	0	0.0	0	0.0	2
Tin F/B	1.6	181	1.9	238	0.1	18	0.0	0	1.2	435
Non-Fe	0.2	27	0.2	19	0.7	88	0.3	1	0.4	135
White Goods	0.0	0	0.0	0	1.7	211	1.1	5	0.6	216
Other	1.1	125	1.1	140	5.0	611	2.5	11	2.4	887
5) YARD WASTE	30.6	3465	19.7	2433	12.9	1580	15.3	67	20.7	7545
6) OTHER ORGANICS	20.9	2363	17.9	2217	24.5	3015	25.1	110	21.2	7705
Food	10.7	1209	11.9	1470	3.1	384	0.2	1	8.4	3063
Tires/Rubber	0.1	16	3.0	377	1.9	230	0.2	1	1.7	624
Wood	2.2	248	1.2	148	15.0	1846	22.8	100	6.4	2341
Ag. Crop Residue	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Manure	0.1	12	0.0	0	0.0	0	0.0	0	0.0	12
Textile/Leather	2.3	261	0.4	45	0.2	23	1.4	6	0.9	336
Other Misc Org.	5.5	617	1.4	178	4.3	533	0.6	2	3.7	1330
7) OTHER WASTES	1.3	149	1.2	146	39.4	4847	51.1	223	14.7	5365
Inerts	1.2	133	0.1	6	39.4	4846	51.0	223	14.3	5207
HHW	0.1	16	1.1	140	0.0	2	0.1	0	0.4	158
8) SPECIAL WASTES a)	1.2	132	0.0	0	1.3	158	0.1	0	0.8	290
Total	100.0	11308	100.0	12358	100.0	12290	100.0	436	100.0	36392

Average may not sum to 100% due to rounding

a) Small Household Appliances

Figure 2 shows the percentage (by weight) of the jurisdiction's total disposed waste by waste source. As shown in the figure, the residential, commercial, and industrial waste sources all comprise approximately 1/3 of the total disposed waste stream.

In the following sections, the results of the disposed waste characterization are discussed as they pertain to the City of Cupertino.

RESIDENTIAL WASTES

Vehicles containing residential waste were sampled each day during the collection vehicle sample period. As shown in Table 2, yard waste is the category with the largest concentration (30.6%) in the disposed residential waste stream. The total paper category has the second largest concentration (30.2%); mixed paper alone comprises approximately 12.6% of the City's disposed residential waste. Food waste comprises 10.7% of this waste stream.

COMMERCIAL WASTES

Generators of commercial waste were sampled randomly from front-and rear-loaders. LAGCO personnel were available during the sampling program to provide assistance in determining load origin and route information regarding wastes from different sources in mixed loads.

The data in the table show that 43.7% of the disposed commercial waste stream consists of paper products, with OCC/kraft and mixed paper having the largest concentrations in this category, at 15.5% and 12.5% of the disposed commercial waste stream, respectively. The category with the second largest concentration in the disposed commercial waste stream is yard waste, at 19.7%. Other organics comprise 17.9% of this waste stream; 11.9% is food wastes.

INDUSTRIAL WASTES

Unlike the other jurisdictions covered by this study, the City of Cupertino does have industrial generators, e.g., Apple Computer. By CIWMB definition, industrial waste also includes material placed into debris boxes. Table 2 shows that 39.4% of the disposed industrial waste stream is in the category other wastes as inerts. The second largest concentration is the other organics category at 24.5% of the disposed industrial waste stream; 15.0% is wood wastes. The data

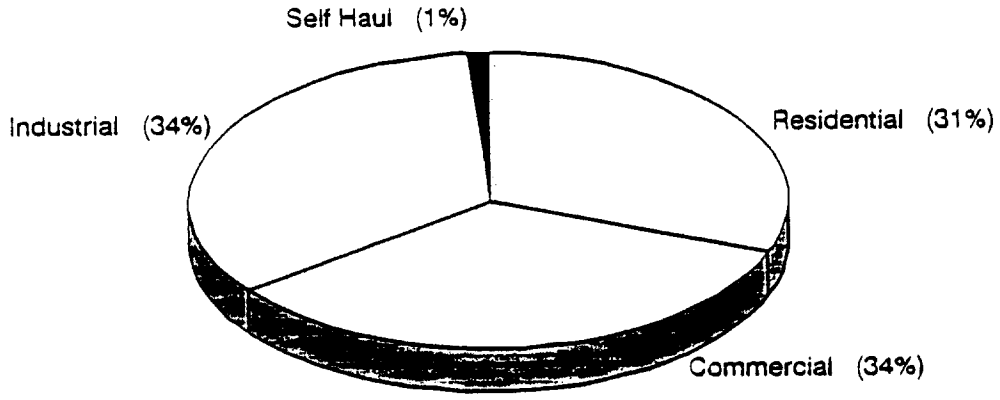


Figure 2.
Percentage (by weight) of
Total Disposed Quantities by Waste Source -
City of Cupertino

show that 12.9% of this waste stream is yard waste. A number of landscape contractors reported that they routinely place yard waste into debris boxes.

SELF-HAUL WASTES

The quantity of self-haul wastes disposed is approximately 1% of the total disposed solid waste stream.

As shown in Table 2, the inerts waste type has the largest concentration (51.1%) in the disposed self-haul wastes. Wood and yard waste comprise 22.8% and 15.3% of this waste stream, respectively.

SEASONALITY

It has been assumed that four seasons could potentially impact the disposed wastes in the City of Cupertino. 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 Cupertino'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),[2] the City of Berkeley (1988/89), North Santa Clara County (NSCC) (1982/83),[3] and San Diego County (1988/89).[4] 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 ±20% of the estimated

[2] "Solid Waste Characterization Study," study prepared by Cal Recovery Systems, Inc. for the City of San Francisco, 1987.

[3] "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.

[4] "Waste Characterization and Market Study," prepared for the County of San Diego by Recovery Sciences, Inc., 1989.

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 ±20% of the average of the four seasons' (26%) projected disposed waste quantities.

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 provided by the City, published by 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 Cupertino (Tons/Year)

Material	Year: / Esc. factor a):	1991	1992 1.027	1993 1.027	1994 1.026	1995 1.025	1996 1.004	1997 1.004	1998 1.004	1999 1.004	2000 1.004	2001 1.001	2002 1.001	2003 1.001	2004 1.001	2005 1.001	2006 1.001
1) TOTAL PAPER		10022	10297	10572	10846	11121	11163	11206	11248	11291	11334	11346	11359	11371	11384	11396	11409
OCC/Kraft		2930	3010	3091	3171	3251	3264	3276	3289	3301	3314	3317	3321	3325	3328	3332	3336
Mixed Paper		3231	3319	3408	3497	3585	3599	3612	3626	3640	3654	3658	3662	3666	3670	3674	3678
Newsprint		1199	1232	1265	1298	1331	1336	1341	1346	1351	1356	1358	1359	1361	1362	1364	1365
High Grade		260	267	274	282	289	290	291	292	293	294	295	295	295	296	296	296
Other Paper		2402	2468	2533	2599	2665	2675	2685	2696	2706	2716	2719	2722	2725	2728	2731	2734
2) TOTAL PLASTICS		2492	2560	2628	2697	2765	2776	2786	2797	2807	2818	2821	2824	2827	2830	2834	2837
HDPE		244	251	257	264	271	272	273	274	275	276	276	277	277	277	278	278
PET		47	49	50	51	52	53	53	53	53	53	54	54	54	54	54	54
Film		1200	1233	1266	1299	1331	1336	1342	1347	1352	1357	1358	1360	1361	1363	1364	1366
Other Plastics		1001	1028	1055	1083	1110	1115	1119	1123	1127	1132	1133	1134	1135	1137	1138	1139
3) TOTAL GLASS		1190	1223	1255	1288	1320	1325	1331	1336	1341	1346	1347	1349	1350	1352	1353	1355
Refillable Glass Bev.		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Calif. Redemption Value		419	431	442	454	465	467	469	471	472	474	475	475	476	476	477	477
Other Recyclable		691	710	729	748	767	770	773	776	778	781	782	783	784	785	786	787
Other Non-Recyclable		80	82	84	86	88	89	89	89	90	90	90	90	90	90	91	91
4) TOTAL METALS		1783	1831	1880	1929	1978	1986	1993	2001	2008	2016	2018	2020	2023	2025	2027	2029
Aluminum Cans		108	111	114	117	120	120	120	121	121	122	122	122	122	122	123	123
Bimetal Cans		2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3
Tin F&B Cans		435	447	459	471	483	485	487	489	490	492	493	493	494	494	495	496
NON Fe/Other Alum		135	138	142	146	149	150	151	151	152	152	153	153	153	153	153	153
White Goods		216	222	227	233	239	240	241	242	243	244	244	244	245	245	245	245
Other Metal		887	911	935	960	984	988	992	995	999	1003	1004	1005	1006	1007	1008	1010
5) YARD WASTES		7545	7752	7959	8166	8372	8404	8436	8468	8500	8533	8542	8551	8561	8570	8580	8589
6) OTHER ORGANICS		7705	7916	8127	8339	8550	8582	8615	8647	8680	8713	8723	8732	8742	8752	8761	8771
Food		3063	3147	3231	3315	3398	3411	3424	3437	3450	3464	3467	3471	3475	3479	3483	3486
Tires/Rubber		624	641	658	675	692	695	697	700	702	705	706	707	707	708	709	710
Wood		2341	2405	2469	2534	2598	2608	2617	2627	2637	2647	2650	2653	2656	2659	2662	2665
Ag. Crop Residue		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Manure		12	12	12	13	13	13	13	13	13	13	13	13	13	13	13	13
Textiles/Leather		336	345	354	363	372	374	375	377	378	379	380	380	381	381	382	382
Other Misc. Organics		1330	1367	1403	1440	1476	1482	1488	1493	1499	1505	1506	1508	1510	1511	1513	1515
7) OTHER WASTES		5365	5512	5660	5807	5954	5976	5999	6022	6045	6068	6074	6081	6088	6094	6101	6108
Inert Solids		5207	5350	5493	5635	5778	5800	5822	5844	5866	5889	5895	5902	5908	5915	5921	5928
HHW		158	163	167	171	176	176	177	178	178	179	179	179	180	180	180	180
8) OTHER SPECIAL WASTES b)		290	298	306	314	322	323	325	326	327	328	329	329	329	330	330	331
Total		36392	37389	38388	39386	40382	40536	40690	40844	40999	41155	41200	41246	41291	41337	41382	41428

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

Appendix A

SANTA CLARA NORTH COUNTY AREA

DISPOSED WASTE FIELD ANALYSIS PLAN

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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 2. Sample Field Data Sheet

WASTE COMPOSITION DATA SHEET FOR _____ Sample Notes: _____

Day/Date: _____
Residential Sample No.: _____
Recorded By: _____

JURISDICTION: _____
Truck Co./No.: _____
Truck Type: _____
Waste Type: _____

Component	Cont. Tare	Gross Weights (lb) Tare				No Tare				Total
Corrugated containers										
Mixed paper										
Newspaper										
High grade ledger paper										
Other paper										
HDPE containers										
PET containers										
Film plastics										
Other plastics										
Refillable beverage										
CA Redemption Value										
Other recyclable										
Other non-recyclable										
Aluminum cans										
Bi-metal cans										
Tin F&B cans										
Non-ferrous/other aluminum										
White goods										
Other metals										
Yard waste										
Food waste										
Tires/rubber products										
Wood wastes										
Agricultural crop residues										
Manure										
Textiles/leather										
Other organics										
Inert solids										
HHW										
Other special wastes										

Notes on HHW:

_____
_____
_____

Misc. Notes:

_____
_____
_____

Table 3. Santa Clara North County Sampling Plan

Waste Source	Los Altos	Los Altos Hills	Cupertino	Unincorporated	Totals[1]	Self-Haul
Residential	10	10	10	10	40	(Visual)
Commercial	8	–	8	5	21	(Visual)
Industrial	6	6	6	6	24	(Visual)
Totals	24	16	24	21	85	

[1]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:

$$n = (t^* \, s/e \cdot \bar{x})^2 \qquad (1)$$

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:

$$mf_i = \frac{w_i}{\sum_{i=1}^{j} w_i} \qquad (2)$$

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:

$$w_i = \text{gross weight - tare weight of container} \qquad (3)$$

TABLE C. Values of Mean ($\bar{x}$) and of Standard Deviation (s) for Within Week Sampling to Determine MSW Component Composition[A]

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	0.06
		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:

$$P_i = mf_i \times 100 \tag{4}$$

9.2.4 For the data analysis to be correct, the denominator of equation (2) must be unity and,

$$\sum_{i=1}^{j} P_i = 100 \tag{5}$$

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:

$$\overline{mf_i} = \frac{1}{n} \sum_{k=1}^{n} (mf_i)_k \tag{6}$$

and the mean percentage of component i, $\overline{P_i}$, is calculated as,

$$\overline{P_i} = \frac{1}{n} \sum_{k=1}^{n} (P_i)_k \tag{7}$$

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:

$s = 0.06$ (from Table C)
$\bar{x} = 0.14$ (from Table C)
$e = 0.10$
t^* $(n = \infty) = 1.645$ (from Table D)

Using equation 1:

$$n = [t^* s/(e \cdot \bar{x})]^2$$

$$= \left[\frac{1.645 \ (0.06)}{0.1 \ (0.14)} \right]^2$$

$$= 50$$
$$= n_o$$

Referring again to Table D, for $n = 50$

$$t^*_{90} \ (n = 50) = 1.677$$

and,

$$n = \left[\frac{1.677 \ (0.06)}{0.1 \ (0.14)} \right]^2$$

$$= 52$$
$$= n'$$

Since 52 (i.e., n') is within 10% of 50 (i.e., n_o), 52 samples should be selected for analysis.

3. SOURCE REDUCTION COMPONENT

3.1 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 regulation, 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 3-1 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 streams in the City of Cupertino indicate that the proportion of the residential, commercial, and industrial waste streams that is most amenable to source reduction (paper, plastic, and yard waste) is significant and can be as high as 27 percent for paper, 7 percent for plastics, and 21 percent for yard waste, depending on the source of waste. The potential for effective source reduction in the City is therefore very high.

This component (1) describes existing conditions and presents source reduction objectives for the City of Cupertino, (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 3-1

TYPICAL EXAMPLES OF SOURCE REDUCTION

DECREASED CONSUMPTION	MATERIAL REUSE
REDUCE MATERIAL VOLUME	Use cloth towels, retreaded tires, refillable pens, reusable air filters, returnable bottles
Make two-sided copies	Reuse packaging or packing material
Use routing slips	Provide returnable packaging containers
Use electronic mail	Donate used equipment
Buy in bulk	Use ceramic coffe mugs
Offer waste reduction incentives to employees	Reuse blank sides of paper for scratch
REDUCE MATERIAL TOXICITY	Use silverware and dishes in the cafeteria
Use product substitues	Compost, mulch or chip on site
INCREASE PRODUCT DURABILITY	Rent equipment rather than buying
Purchase durable goods	Use a waste exchange program
design durable products	Design for reuse or recyclability
Provide/use maintenance contracts to extend the life of equipment	

3.2 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 City . 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 City of Cupertino 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 evaluated below in the section entitled "Evaluation of Alternatives" according to their effectiveness in meeting the source reduction objectives outlined above.

3.3 EXISTING CONDITIONS DESCRIPTION

This section describes existing source reduction activities and programs in the City of Cupertino. The jurisdiction has carefully reviewed and documented all potential and ongoing source reduction efforts.

The quantities of wastes diverted by the City's source reduction activities, by waste category and waste type, are presented in Section 2 Waste Characteristics Study.

Local Government Activities

The City currently engages in the following source reduction activities:

- residential rate structure: per can rate with higher cost to customers as more cans are used.
  One can $8.95, two cans $11.00, three cans $14.50, extra $10.00.
- purchasing programs for products with recycled material content, retread tires, reduced packaging, and bulk purchases
- use of double-sided copiers in offices and print shops
- use of electronic mail, routing slips
- use of non-disposable cups and utensils in food service programs

- reuse of uniforms and shop rags in public motor pool garages and facilities
- programs to provide education and information to employees and the general public on source reduction

Residential Activities

Residential source reduction activities in the City include:

- composting yard wastes
- 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

Commercial and Industrial Activities

Commercial and industrial activities in the City include:

- commercial purchasing programs providing for high-volume purchases, preferences for goods with recycled materials content, and specifications for goods with higher durability
- reuse of materials
- waste audit programs
- commercial landscaping and grounds maintenance programs that specify composting of the resulting wastes
- use of scratch pads from blank sides of scrap paper
- cloth towels and sponges in the cafeteria
- routing memos

- reuse of file folders
- posting of source reduction and recycling reminders on bulletin boards and memos
- use of refillable pens and mechanical pencils
- use of scrap paper for interoffice communications
- rented equipment (instead of purchasing)
- donation of old equipment to schools and charities
- storing of reports on microfiche instead of paper
- use of reusable coffee filters
- storage of information binders shelved in the library for general staff use instead of providing copies for personal files
- use of shredded paper for packaging material
- reuse of cardboard boxes
- electronic mail

Of the source reduction activities and programs identified above, the City 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 description of existing conditions for some source reduction activities is therefore qualitative. Additionally, many of the source reduction activities affecting the waste generated by the City are actually being conducted on a national scale. National efforts affecting the products purchased in stores and used by residences and businesses within the City are described below.

National Source Reduction Efforts

The following are some examples of major national source reduction efforts: [1]

- Some manufacturers offer concentrated versions of Products which use less packaging, (e.g., frozenjuices, 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 then preceding design.

  - 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.

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1 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-O-424, Washington, D.C.: U.S. Government Printing Office, October 1989.

- Designed for Disassembly or D.F.D. is one world-wide source reduction effort which is becoming a reality on the national level. D.F.D. is a method of marking major components of a product with a recycling code. D.F.D. will ultimately reduce waste and promote effective recycling.

- One soap manufacturer has made a single-bar shampoo 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.

3.4 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. Cost 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 waste audits, technical assistance to industry and consumer organizations, backyard composting workshops, 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 recordkeeping 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 and disposal and provides a direct link between fee levels and

generated quantities of non-recyclable wastes. 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 City of Cupertino 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 City of Cupertino.

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 City (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.

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, reduced business license fees, 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 City 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 City of Cupertino 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 City 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 City 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 City 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 City 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 City to utilize the expertise and resources of volunteer interest groups in the community.

Economic Disincentives. Penalties and/or fines could be imposed by the City on businesses that do not develop and implement source reduction programs and practices. Alternatively, a municipality could impose a fine on businesses 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, businesses 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 businesses for this program in the form of a pamphlet and informational flyer describing the kinds of data sought by the jurisdiction and its usefulness.

The requirements of this type of program could be restricted to large commercial or institutional generators, thereby reducing enforcement costs. This requirement would serve to highlight the importance of community waste reduction efforts to businesses.

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. Moreover, this type of program would generate valuable waste stream data on commercial businesses, as well as on source reduction practices. These 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.[2] 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 lifespans to induce the consumer to purchase the longer-lasting alternatives. Examples of these kinds of products are tires, batteries, and appliances.

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2 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.

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 City, 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 non-residential (for incentives applied through education and technical assistance programs). Additionally, advanced disposal fees would target residential and non-residential 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 changes in consumption patterns, availability of materials, and the economy. As the City, 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, whether applied directly by businesses or indirectly through education and technical assistance programs, 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 (1) backyard composting, (2) commercial procurement programs, and (3) consumer purchasing awareness programs. Waste stream materials affected by these types

of programs are yard wastes and wood cuttings, office paper, plastic and paper packaging, corrugated cardboard, and other packaging products.

Implementation Period. Economic incentives must be approved by Cupertino City Council. 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 jurisdictions in the City.

Consistency with Local Plans and Policies. Providing economic assistance to businesses within the City 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 City must administer a system for collecting and dispersing revenues gained through fees, fines, and penalties.

Estimated Cost. The costs of this alternative would include the use of the City 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 City . 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 waste evaluations,

technical assistance, educational efforts, promotional programs (i.e., public recognition and awards), and municipal source reduction programs.

Waste Evaluations. Waste evaluations identify the waste types generated by a business that can be targeted for source reduction activities. A number of approaches to waste evaluations could be implemented by the City. For example, the City could assist selected, large-quantity commercial generators in the community to conduct waste evaluations to identify what types and amounts of wastes are being generated and to assist them in identifying and implementing source reduction techniques. Waste evaluations might be restricted to certain categories of commercial generators according to Standard Industrial Classification (SIC) codes, employee size, or by the quantity and type of wastes known to be generated by those enterprises. Restricting, or selecting, the number of generators that will complete these waste evaluations reduces the administrative burden and cost of these programs. Additionally, restricting the scope of this program ensures greater effectiveness by focusing on larger generators that contribute significantly to the waste stream. The City could exempt businesses in the service sector, such as professional services and retailers, as well as provide for special programs for institutional generators, such as hospitals, convalescent homes, and government facilities.

Data collected from the waste evaluations could also be used for:

(1) assessing proper waste disposal fees;

(2) controlling the disposal of banned wastes (if any) into the waste stream (e.g., corrugated cardboard, organic wastes, and household hazardous or special wastes); and

(3) establishing a baseline for waste generation data from which to measure future progress in waste reduction.

These evaluations could be required periodically to provide for monitoring and evaluation of generator progress and could be made a provision of the waste generator's business license or waste disposal contract. The primary purpose of the waste evaluation alternative is to increase commercial awareness of the need for, and benefits of, waste reduction programs and to assist businesses to design and implement programs reducing waste generation.

Technical Assistance. Technical assistance to businesses and consumers can be accomplished through workshops and seminars that address practical ways businesses and consumers can 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 by the community. Although technical assistance programs are often targeted at residential generators, these programs could also be applied to commercial and 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.

Educational Efforts. Educational efforts by the City 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 City 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 (public and private, residential and commercial) to efficiently exchange source reduction information. Examples of this include:

- Providing businesses with information on how to reduce waste disposal by reducing generation and reusing products.
- Providing source reduction pointers ranging from procurement practices to the use of double-sided copying and using waste paper as scratch paper.
- Encouraging consumer organizations to meet with businesses to develop different approaches to product retailing.
- Offering businesses engaged in fostering source reduction (such as bulk-purchase stores or stores catering to yard waste composting activities) the opportunity to conduct workshops or seminars.

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.

Public Recognition and Awards. Public recognition can be used by the City to publicly acknowledge businesses 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. Through public recognition, the City can generate public support for source reduction efforts by recognizing businesses, private groups, and individuals who actively engage in source reduction efforts and support the community's source reduction programs. 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 city-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 City 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 City 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: waste evaluations; 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 City, 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: residential and non-residential/commercial. 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, businesses, 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 City 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 City 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 City by virtue of the informal relationship between the public agencies, businesses, 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, 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 business 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, commercial purchasing and procurement, office source reduction, and consumer-purchasing awareness programs. The waste stream materials affected by these types of programs are:

- yard wastes and wood cuttings
- office paper and plastic packaging
- 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, 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 City would be required. Existing educational facilities could serve as locations for seminars and educational workshops.

Consistency with Local Plans and Policies. Technical assistance, education, and promotional activities appear to be consistent with current policies in the City .

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

Estimated Cost. The costs for technical assistance, education, 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 City for developing and administering the program. Although staffing would constitute the majority of the costs of implementing technical assistance, public education, and promotional activities, the programs outlined under this alternative involve some direct costs including: (1) costs associated with promotional brochures, pamphlets, flyers, doorhangers, 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 for the waste evaluation depend on the level of information collected. The City will structure the requirements of this program so that target generators can conduct the waste evaluation using in-house staff and expertise. The bulk of the cost of this program involves staff resources to conduct the waste evaluation and to process the resulting data.

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 City . 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 City 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 City specifying that several criteria be considered in the procurement selection of products and packaging, including: durability, recyclability, reusability, and recycled material content. Additionally, the City could specify that any business or 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 City 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 and commercial waste 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 and commercial businesses 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 City could enact regulations requiring waste management planning as a condition for opening a new business, relocating an old one, or building or otherwise developing property for commercial 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 City , 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 City , (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 City administrative offices and other operations
- larger commercial and 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 City.

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 or commercial 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 volumes or toxicities of wastes disposed.

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 City .

Institutional Barriers. Purchasing and procurement programs within the diverse public agencies will have to be coordinated in order to achieve a City-wide impact from a source reduction procurement program. While purchasing and procurement itself is often centralized within a City'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 City 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.

End Uses. Not applicable

3.5 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 City presents the results of the qualitative evaluation of the alternatives and programs presented in the previous section. To accomplish this, the City has applied an assessment of whether or not each alternative is appropriate to the City's needs and assigned each alternative a ranking in order to select various alternatives and programs. In selecting among alternatives and programs, the City 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, and solid waste management system), and (2) the degree to which the alternatives and programs complement each other and form a coherent, comprehensive, and cost-effective package.

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 below.

Short-Term Planning Period (Through the year 1995)

In order to meet the goals and objectives outlined in this component, the City has selected the following programs and alternatives:

- Continue a variable rate structure for both commercial and residential collection for projected rates for one

can, $12.00; two cans, $24.00; three cans, $36.00; four cans, $48.00; after expanding recycle program.

- Review disposal fees for large, bulky items such as white goods and furniture.

- Review small grants to community public service groups that support community programs by providing technical assistance or public education.

- Review a program to conduct waste evaluations of all, of the commercial businesses in the City.

- Review a program to provide technical assistance to businesses and consumers/homeowners through workshops and seminars on source reduction techniques and activities.

- Continue a program to provide public education efforts through the media, the school system, and City programs to increase awareness of source reduction and waste management issues.

- Review a program to provide public recognition and awards to individuals and businesses that implement source reduction activities.

- Continue a City procurement program and policy to encourage source reduction through purchasing decisions.

- Continue any multi-jurisdictional approaches to source reduction such as public education, disposal fees, and technical assistance.

Medium-Term Planning Period (Through the year 2,000)

All programs and alternatives selected in the short-term planning period will be continued in the medium-term. In addition, the City has selected the following programs and alternatives:

- Continue a program to provide direct economic benefits to businesses and private organizations to implement source reduction programs.

- Review a program to impose penalties and/or fines on businesses that do not develop and implement source reduction programs and practices and report their progress to the City.

- Continue a program to establish waste reduction plans for large, commercial or institutional waste generators.
- Continue a program to establish land-use requirements that promote source reduction planning.
- Review a program to institute product bans for certain materials and products sold within the City.
- 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.

3.6 PROGRAM IMPLEMENTATION

The Public Works Department will be responsible for implementing the selected alternatives and programs; the specific tasks necessary to achieve full implementation of the selected alternatives and programs.

The City currently has an inverted rate structure for the residential sector. When the yard waste program begins in fall of 1992, the City will review further rate restructuring.

Educational materials that address source reduction will be developed in the fall of 1992. Informational materials will be developed to increase awareness about the benefits of source reduction and changing consumption patterns.

3.7 MONITORING AND EVALUATION

To ensure that the selected source reduction alternatives and programs are meeting the goals and objectives of this component, the City 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 City'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 and 7.

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 conducted 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: An annual residential survey will be conducted 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 commercial and industrial sectors

Monitoring Method: An annual business survey will be conducted to monitor procurement practices and to identify reductions in the purchase of non-recyclable materials and products. The survey might also monitor trends towards replacing less durable and single-use materials with more durable and reusable products, materials, and equipment.

Written Criteria

The City will prepare annual 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 the Department of Public Works.

Funding Requirements

Funding for the monitoring and evaluation program described in this section will be provided by the City through Cupertino Resource Recovery Fund. Funding for this program includes the costs of (1) administrative activities, (2) recordkeeping, (3) program monitoring and surveying, (4) tracking of survey results, and (5) annual report-writing.

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.

4. RECYCLING COMPONENT

4.1 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 because of disposal capacity constraints that place 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 reduces the environmental impacts associated with waste disposal.

As defined 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 City of Cupertino recognizes the value of recycling and seeks to support appropriate programs and services dedicated to the recycling of a broad range of materials. This component (1) describes existing conditions and presents recycling objectives for the City, (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 the selected recycling programs. Throughout this component, waste streams are described as "residential" and "non-residential," with the latter signifying both commercial and industrial waste streams.

4.2 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 City . 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

- Increase participation in residential recycling programs
- Increase participation in multi-family dwelling recycling programs
- Expand multi-family dwelling recycling program to city-wide by mid 1992
- Increase participation in commercial recycling programs
- Expand the number of material types collected from the residential and commercial sectors
- Expand a diversion program for materials currently collected via commercial/industrial containers.
- Establish recycling programs throughout City facilities
- Expand current education and public information programs
- Divert inert solids generated by City agencies (e.g., Department of Public Works, Municipal Utilities, and Capital improvement projects)

Medium-Term Objectives

- Divert additional waste types from the residential and commercial waste streams
- Increase local demand for materials made from post-consumer waste
- Develop additional plastic recycling operations to include a wider variety of polymer types as market develops.
- Continue programs implemented in the short-term planning period

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 material; (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.

- corrugated cardboard

- newspaper
- high-grade office paper
- mixed paper
- telephone books
- wood wastes
- PET, HDPE, and other plastics
- film plastic
- glass
- aluminum cans
- tin cans
- other scrap metal
- inert solids (asphalt, concrete, construction and demolition debris)

Recycling alternatives targeting the above waste types are evaluated below in the section entitled *Evaluation of Alternatives* according to their effectiveness in meeting the recycling objectives outlined above.

4.3 EXISTING CONDITIONS

This section describes existing recycling activities and programs in the City. The jurisdiction has carefully reviewed and documented all potential and ongoing recycling efforts, including all the City programs. The City has also used a survey to identify recycling efforts, including local market development activities, sponsored by private entities such as refuse collection companies, solid waste facility operators, including transfer stations, disposal sites, and material recovery facilities, secondary materials buyers and processors, non-profit recyclers, local chapters of environmental interest groups, local public service groups, trade associations, private businesses and industry, and groups associated with universities and local educational institutions.

The quantities or wastes diverted by the City's recycling activities, by waste category and waste type, are presented in Table 4-1. A description of the survey method used to identify and

quantify the recycling activities is presented in Appendix B and C.

Local Government Activities

The City of Cupertino currently engages in the following recycling activities:

- mixed paper recycling program
- purchasing programs for products with recycled material content
- programs to provide education and information to employees and the general public on recycling
- divert inert solids generated by the City's Department of Public Works and capital improvement projects.

Residential Activities

Los Altos Garbage Company (1265 Pear Avenue, Mt. View) the franchise hauler for all solid waste in the city, is currently contracted by the city to provide bi-weekly curbside collection of recyclable products from single-family homes. Los Altos Garbage collects newspaper, aluminum and tin cans, plastic (PET) bottles, glass jars and bottles, and used motor oil. All the recyclable materials are placed in "ungarbage" co-mingled bins. Newspapers and mixed papers are bundled separately, and used motor oil is collected in one gallon screw-on top plastic containers. A curbside recycling pickup for Christmas trees following the Christmas season, and spring and fall collection programs concentrating on certain materials are also provided by Los Altos Garbage Company.

Multi-family Recycling

Los Altos Garbage Company provides:

- Pilot program for multi-family collection
- Serves 600 units via toter collection system
- Will provide service for all multi-family customers by November 1992

- Recyclable items collected will be the same as residential co-mingled program

Buy-back Recycling Programs

There are currently two facilities in the City of Cupertino which accept "CA Redemption Value" beverage containers

- 20/20 — 10425 De Anza Blvd.
- envipco — 20620 Homestead Road

Drop-off Centers

- Cardboard
  - Fire station — 22620 Stevens Creek Blvd.
  - Fire station — 21000 Seven Springs Parkway
- Telephone Book
  - Six-week recycling drive at two drop-off locations in the city:
    - 10425 So. De Anza Blvd.
    - 10555 Mary Avenue

Public Information

California Materials Exchange - CALMAX materials listing catalog is analogous to classified ads listing for "waste" materials available and wanted throughout California. For CALMAX information call (800) 553-2962.

Cupertino Scene - a monthly newsletter produced by the City and mailed to every resident and business owner in the City provides public information regarding the various recycling programs.

Exhibits - display source reduction, recycling, and composting programs at special events.

Table 4 - 1 DIVERSION QUANTITIES

(Tons, 1991)

	RESIDENTIAL CURBSIDE	MULTI-FAMILY COLLECTION	CITY OFFICES	COMPOSTING	BUY-BACK 20/20	DROP-OFF	COMMERCIAL ON-SITE	TOTAL DIVERSION
PAPER	2419.0	0.0	11.0	0.0	0.0	0.0	3028.0	3028.0
corrugated containers	0.0	0.0	0.0	0.0	0.0	0.0	1724.0	1724.0
newspaper	2419.0	0.0	0.0	0.0	0.0	0.0	41.0	2460.0
high grade ledger paper	0.0	0.0	0.0	0.0	0.0	0.0	142.0	142.0
mixed paper	0.0	0.0	11.0	0.0	0.0	0.0	1100.0	1100.0
other paper	0.0	0.0	0.0	0.0	0.0	0.0	21.0	21.0
PLASTICS	51.0	0.0	0.0	0.0	13.0	0.0	16.0	16.0
HDPE containers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PET containers	51.0	0.0	0.0	0.0	13.0	0.0	16.0	80.0
film plastics	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
GLASS	602.0	0.0	0.0	0.0	152.0	0.0	312.0	312.0
refillable bev. containers	0.0	0.0	0.0	0.0	0.0	0.0	230.0	230.0
CA Redemption Value	482.0	0.0	0.0	0.0	152.0	0.0	7.0	641.0
other recyclable glass	120.0	0.0	0.0	0.0	0.0	0.0	75.0	195.0
other non-recyclable glass	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
METALS	195.0	0.0	0.0	0.0	36.0	0.0	831.0	831.0
aluminum cans	156.0	0.0	0.0	0.0	36.0	0.0	16.0	208.0
bi-metal containers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
tin cans	39.0	0.0	0.0	0.0	0.0	0.0	0.0	39.0
other ferrous	0.0	0.0	0.0	0.0	0.0	0.0	810.0	810.0
other aluminum	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	1.0	1.0
white goods	0.0	0.0	0.0	0.0	0.0	0.0	4.0	4.0
YARD WASTE	0.0	0.0	0.0	0.0	0.0	0.0	136.0	136.0
OTHER ORGANICS	0.0	0.0	0.0	0.0	0.0	0.0	1095.0	1095.0
food waste	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	28.0	28.0
wood wastes	0.0	0.0	0.0	0.0	0.0	0.0	1067.0	1067.0
agricultural crop residues	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
diapers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
other misc. organics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OTHER WASTES	114.0	0.0	0.0	0.0	0.0	33.0	0.0	0.0
inert solids	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
batteries (a)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
oil (a)	114.0	0.0	0.0	0.0	0.0	0.0	0.0	114.0
other HHW's	0.0	0.0	0.0	0.0	0.0	33.0	0.0	33.0
SPECIAL WASTES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ash	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
industrial sludge	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
auto shredder waste	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
mattresses	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
other special waste	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	3381.0	0.0	11.0	0.0	201.0	33.0	5418.0	9044.0

(a) Considered Household Hazardous Wastes (HHW).

Commercial and Industrial Activities

Los Altos Garbage Company, the franchised hauler for all waste in the city, including the commercial/industrial sector, has the exclusive contract for all mixed recyclables that are collected in compactor containers. An incentive for companies utilizing compactor services for mixed recyclables may realize up to 63% reduction in their cost if the contents of the compactor contains less than 10% contamination. Ten percent contamination is identified by primarily wet waste and material classified as non-recyclable due to the nature of the material and/or processing involved to salvage recyclable matter.

Other Services Provided:

- mixed paper collected separately
- separate collection of recyclables, including aluminum cans, tin cans, PET, glass, newspaper, corrugated cardboard, scrap metal, polystyrene, white paper, and wood material
- restaurant/bar glass collection
- high-grade office paper collection
- commercial and retail corrugated cardboard collection
- shopping center recycling programs for merchants and customers collecting items such as cardboard, glass, corrugated cardboard
- Cupertino Union School District's citywide recycling program

Single source separated commodities in the commercial/industrial sector may be collected by independent recyclers. The city will be working with companies that contract with these independent recyclers to provide weight reports to the city.

4.4 PROGRAM ALTERNATIVES

The City 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 the residential sector, the non-residential sector, and those that apply to both sectors. 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 approaches presented below.

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

Residential Alternatives

ALTERNATIVE 1 - CURBSIDE COLLECTION

This alternative addresses the objective of collecting recyclables from single-family homes. Curbside collection is the most effective method of achieving high rates of residential participation in recycling programs. Curbside programs can involve collection of either separated or mixed recyclables. Once the curbside program is fully-established, additional materials, such as corrugated cardboard and magazines, can be added in order to increase recovery via curbside.

Another option is to begin wet/dry collections at the curb, similar to systems 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 yard waste material that will go to a composting site. These materials would likely be composted. The third can contains all other material that cannot be separated and would likely 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 City, 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 shifts in waste-type generation.

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

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 implementing this alternative. However, the jurisdiction must determine that markets exist for the materials that will be separated and recovered under this alternative. If no feasible local markets exist for the materials, the community would have to store the collected materials until an outlet is found for their sale. In addition, some materials (e.g., wrappers from food

stuffs) often cannot be stored for more than one week without being treated in some way or removed from the collection and recovery program. Finally, the jurisdiction must review existing waste collection contracts for consistency with the proposed program.

Estimated Cost. Costs for the programs presented in this alternative would depend upon the scope of the projects undertaken and the existing programs and conditions in the jurisdiction.

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, by definition, is one which moves and can service more than one area. Under AB 939, the City 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 City, 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 impact on shifts in waste-type generation.

Implementation Period. This alternative would 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 collected recyclables would also be required.

Consistency with Local Plans and Policies. This alternative is consistent with City policies.

Institutional Barriers. The jurisdiction must determine that markets exist for materials that will be separated and recovered under this alternative. If no feasible local markets exist for the materials, the community would have to store the collected materials until an outlet is found for their sale. Some materials (e.g., wrappers for foodstuffs) often cannot be stored for more than one week without being treated in some way or removed from the collection and recovery program. Additionally, for jurisdictions that already have other city-sponsored and privately sponsored collection systems in place, establishing a mobile collection system could potentially impact the success of the existing operations. Finally, the City must review the availability of land at different locations within the city to site the collection and processing facility.

Estimated Cost. Costs for the programs presented in this alternative would depend upon the scope of the projects undertaken and the existing programs and conditions in the jurisdiction. The capital costs to establish a mobile collection system are estimated to range from $250,000 to $300,000.

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 City 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 the 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 City, 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, such as curbside, where

the generator is not paid for the materials recovered.

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 shifts in waste-type generation.

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

Facility Requirements. New facilities would be required. A site, facility, 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.

End Uses. See section titled "Market Conditions."

Public vs. Private Operation. A buy-back center would probably be privately operated.

ALTERNATIVE 4 - RECYCLING PROGRAM: MULTI-FAMILY DWELLINGS

This alternative addresses the objective of establishing programs for the collection of recyclable materials from multi-family dwellings. Multi-family dwellings typically house apartment, condominium, and townhome residents, as well as residents of senior citizen homes and mobile home parks. In the City, most duplexes and townhomes are considered multi-family dwellings.

Currently in the City there is a pilot recycling program on-site at multi-family dwellings. There are approximately 4032 multi-family dwelling units in the City. This number is projected to increase approximately 0.2 percent by 1995, and to represent approximately 26 percent of the total number of housing units in the City. Programs will likely be tailored to the particular multi-family area; for instance, a senior citizen's residence may have different needs than an apartment complex.

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

Effectiveness. A recycling program for multi-unit dwellings is expected to be effective in reducing the amount of targeted material in the solid waste stream. Materials collected would likely be newspaper, glass, aluminum cans, and PET plastic. The success of the program will depend on how well the particular needs of each type of multi-unit dwelling are considered.

Hazard. Recycling programs at multi-unit dwellings present moderate hazards, which will depend on the type of program in place. For instance, broken glass or other miscellaneous items can be a problem with multi-bin or multi-compartment systems.

Ability to Accommodate Change. Multi-unit dwelling recycling programs are readily adaptable to changing conditions. The program is more readily adaptable to changing conditions if residents and multi-family dwelling managers are kept up-to-date on changes in the program. This task could be accomplished by the hauler, City staff, or volunteer groups.

Consequences to the Waste Stream. Multi-unit dwelling recycling programs would have no impact on shifts in waste-type generation.

Implementation Period. This alternative would likely be completed within the short-term planning period (1995).

Facility Requirements. Facilities would be required at (1) the multi-family complex for placement of the recycling bins and (2) a location suitable for processing and storing the collected materials. Some existing multi-family facilities could develop a space problem as the program grows, since space is generally at a premium. Trade-offs may be required in order to utilize parking areas or open areas for recycling collection containers. In addition, the City may require that garbage/recycling collection areas be enclosed, which could require changes to accommodate recycling.

Consistency with Local Plans and Policies. Minor changes to existing plans and policies would be required. These could include

changes to any agreements between the City or hauler with a given multi-unit dwelling with regard to its garbage collection. In addition, City policies may need to be adapted to allow for unenclosed garbage/recycling collection areas, if this is needed and if City policies currently prohibit it. Lastly, the City could require changes to zoning and building ordinances to require that recycling collection areas be built into all new multi-unit developments.

Institutional Barriers. Moderate institutional barriers exist with this alternative. With rental property, turnover in property managers, on-site managers, and tenants often makes it difficult to keep residents apprised of recycling programs and any changes made in these programs. Also, the facility manager may have to give up parking or other space in order to accommodate the recycling program; parking space requirements are usually set by local ordinance standards. This can be remedied with strong public education efforts.

Estimated Cost. Los Altos Garbage Company is currently evaluating costs for a multi-family dwelling recycling program in the City. Cost considerations include type of collection container, type of collection service (e.g., door-to-door versus central locations), type of collection vehicle (new trucks may be needed), and type of labor (i.e., one or two-person crew).

End Uses. See section titled "Market Conditions."

Public vs. Private operation. These types of facilities could be operated by either a public or private entity.

Non-Residential Alternatives

ALTERNATIVE 1 - COMMERCIAL/INDUSTRIAL RECYCLING PROGRAM

This alternative addresses the objectives of increasing the number of material types collected from the commercial sector and increasing participation in commercial recycling programs. In order to recycle more of the commercial/industrial waste stream, a comprehensive recycling program will have to be expanded and a broader range of materials collected. Because the commercial/industrial waste stream accounts for 67 percent of the City's waste stream, the City can expect to divert a significant portion of the waste stream through a commercial/industrial recycling program. Before instituting a City-wide commercial/industrial collection program, the City could undertake a one-year pilot program to determine the best method of collection (e.g., a two-bin system, a multi-bin system, etc.)

This alternative is evaluated below to determine whether it is

appropriate for the City, as well as to compare it to other alternatives.

Effectiveness. This alternative would be effective in reducing the amount of targeted recyclable material in the commercial/industrial waste stream. Materials collected would likely include newspaper, PET, glass, tin and aluminum cans, high-grade office paper, and corrugated cardboard. Other materials that could be considered are HDPE, film plastic, ferrous metals, and wood.

Hazard. This alternative presents no major hazards.

Ability to Accommodate Change. Commercial collection programs are readily adaptable to changing conditions such as increased participation rate or the addition of another material type for collection. Additional trucks could be added or more frequent collection of materials could occur to accommodate changing conditions.

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

Implementation Period. The implementation schedule is dependent on the number of materials included in the program and the number of businesses targeted to participate in the program. However, this alternative would likely be completed in the short-term planning period (1995).

Facility Requirements. Facility needs for this alternative include additional trucks, drivers, and collection containers. In addition, access to a material recovery facility will be needed to process the additional volume of materials collected.

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

Institutional Barriers. One of the major problems associated with commercial/industrial recycling programs is the need for markets for the large quantities of materials collected. In addition, some businesses are unwilling to participate in recycling programs, as these programs are generally not revenue-producing, and often even cost the company. Also, space constraints for waste collection at commercial/industrial facilities are often a barrier.

Estimated Cost. The cost of a commercial/industrial recycling programs is dependent on the number of recyclable materials collected and the service area.

End Uses. Please see section titled, "Market Conditions."

Public vs. Private Operation. This type of program can be operated by either a public or private entity.

ALTERNATIVE 2 - CURBSIDE PROGRAM

This alternative addresses the objective of establishing source separation recycling programs for small volume non-residential waste generators in the downtown, high-density commercial areas where many small businesses have little room to store recyclable materials. This alternative resembles the residential curbside program, although the potentially small volumes of waste generated from these businesses may make it difficult for haulers to collect from them. Other small business parks and shopping areas could also be targeted. Indeed, it is possible that this program would be an extension of the existing residential curbside program; trucks would drive a specified route around downtown, with stops to pick up materials left at the curb by businesses. This service would coincide with the day refuse is collected.

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

Effectiveness. This alternative would be effective in reducing the amount of targeted material(s) in the waste stream. Materials collected would likely include corrugated cardboard; newspaper; PET; glass; tin and aluminum cans; white ledger, computer, and colored ledger paper.

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 shifts in waste-type generation.

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

Facility Requirements. Existing storage area at businesses may need to be expanded or altered in order to provide room for one week's worth of recyclable materials.

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

Institutional Barriers. There are no known barriers to implementing this alternative. However the jurisdiction must determine that

markets exist for the materials that will be separated and recovered under this alternative. If no feasible local markets exist for the materials, the community would have to store the collected materials until an outlet is found for their sale. In addition, some materials (e.g., wrappers for foodstuffs) often cannot be stored for more than one week without being treated in some way or removed from the collection and recovery program.

Estimated Cost. Costs for the programs presented in this alternative would depend upon the scope of the projects undertaken and the existing programs and conditions in the community. Costs may include purchasing collection containers for each business, new trucks, additional staff, and processing costs.

End Uses. See section titled "Market Conditions."

Public vs. Private operation. This type of program can be operated by either a public or private entity.

ALTERNATIVE 3 - MANUAL MATERIAL RECOVERY OPERATION/MECHANIZED MATERIAL 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 operation 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 materials. 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 City, 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 title "Market Conditions."

Public vs. Private operation. These types of facilities can be operated by either a public or private entity.

ALTERNATIVE 4 - 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 dedicated 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 City, 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 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 be 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.

End Uses. See section titled "Market Conditions."

Public Vs. Private Operation

This alternative could be either a public or private operation.

ALTERNATIVE 5 - DIVERT INERT SOLIDS GENERATED FROM CITY PUBLIC WORKS AND PRIVATE CONSTRUCTION/DEMOLITION PROJECTS TO A MATERIALS PROCESSOR.

This alternative addresses the objective of increasing recovery of recyclable construction materials and inert solids. City public works crews are responsible for a small, portion of the construction projects in the City; the remainder are projects with private construction firms. The City is aware that used asphalt or concrete is recyclable and may be used as road base and other construction material. Under this alternative both the City Public Works Department and any contractors working in the City will be responsible for taking the used materials to an established processor. Small quantities (e.g., 4 tons or less) would be exempt from this requirement.

This alternative is evaluated below to determine whether it is appropriate for the City, 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 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 and concrete is stable.

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

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

Facility Requirements. No 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 is impacted by moderate barriers; the contractors may object to having to take the used materials to a processor; the City can include this in their bid requirements.

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. Primarily road base, aggregate and bedding.

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

Residential and Non-Residential Alternatives

ALTERNATIVE 1 - DROP-OFF RECYCLING CENTER

Drop-off recycling centers range in size, from "igloo" style domes, to large centers. They require that the generator source separate recyclable materials and take them to the drop-off site. Drop-off recycling centers tend to target recyclables from residential sources and tend to be located in areas where they are readily accessible to homeowners and multi-unit dwellers. However, they may also be located in more commercial, urban areas and serve smaller businesses and downtown areas. They may be located at solid waste transfer and disposal facilities as well. Drop-off sites are sometimes unstaffed, but staffing provides control over the types of materials left at the facility, contamination levels, and the appearance of the facility. Small-scale drop-off recycling centers are generally located in parking lots of grocery stores, shopping centers, churches, or schools. Drop-off recycling centers can make recycling more convenient for persons who do not have curbside service and also provide a back-up for those who do have curbside.

Drop-off centers usually accept the full range of commonly recycled materials such as newspaper, glass, plastics, and aluminum cans. They can be expanded to include other materials such as corrugated cardboard, scrap metals, and both high-grade and mixed paper.

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

Effectiveness. Drop-off recycling centers can be effective in diverting recyclables from the waste stream. This is especially true of jurisdictions that do not have other programs in place, such as curbside or mobile collection systems. The jurisdiction will have to carefully consider the impact that several different programs can have on each other as some programs can adversely affect other programs. Jurisdictions with many recycling collection systems in place can expect minor impact from a drop-off recycling center.

Hazard. Drop-off recycling centers present moderate hazards. Because these sites are often unstaffed, they can become "dump sites." As a result, potential hazards include broken glass or other debris around the drop-off containers, wind-blown litter, and disposal of hazardous waste. In addition, for the safety of the users, sites need to be well-lit and have adjacent parking.

Ability to Accommodate Change. Drop-off recycling centers are moderately flexible, in that material types can be added quickly, as new markets develop. Increased contamination of materials, however, would render drop-off sites less flexible.

Consequences to the Waste Stream. Adding drop-off recycling centers would have a moderate impact on the waste stream. The potential for contamination of materials could render these materials less marketable.

Implementation Period. This alternative could be implemented in the short-term planning period (1995).

Facility Requirements. Drop-off centers would have to be built or set up in designated sites. Considerations include a central, accessible site; protection from weather (to keep paper dry); plenty of storage area for materials; good vehicle access (for both collection trucks and the public); and security (i.e., locked containers).

Consistency with Local Plans and Policies. Drop-off recycling centers are consistent with City plans and policies when located within properly zoned areas.

Institutional Barriers. Frequently, businesses and property owners

are against the idea of a drop-off bin in their parking lot, primarily due to the mess that can result if these drop-off areas become dump sites. For this reason, the drop-off program could not operate in those locations without the businesses' and property owners' approval and cooperation.

Estimated Cost. Costs depend on the type of drop-off center selected; costs include those for site acquisition, preparation, capital, and operating expenses.

End Uses. Please see section titled "Market Conditions."

Public vs. Private Operation. Drop-off recycling centers can be owned and operated by either public agencies, or by private non-profit or for-profit entities.

ALTERNATIVE 2 - CHANGES TO ZONING AND CODE PRACTICES

The City will 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 include a zoning ordinance that would require all new land development projects to plan and provide for recycling needs in building and site design, with the exception of single-family homes. Land use and development requirements involve establishing incentives and disincentives to land use and development 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 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 City could identify recycling specifically in local codes for allowable land uses for a given zoning.

The City is also aware of the Recycling Market Development Zones established under SB 1322 and is considering this option in conjunction with other local jurisdictions. A community that is a designated Zone offers state and local government incentives to draw to that community industries that use post-consumer waste as the feedstock in their manufacturing processes. Zones will help stimulate economic development in communities by increasing jobs and increasing the tax base.

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

Effectiveness. The effectiveness of these regulatory programs would depend on the level of change implied by the regulations

imposed by the City, 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 City.

Consequences to the Waste Stream. This alternative has no known impact on shifts in 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 the 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 anticipated resistance by generators to any further regulation by the City. 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 City 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 to recycling may not pose any conflict for the City.

Institutional Barriers. Institutional barriers to this alternative involve potential conflicts within the jurisdiction between City agencies responsible for implementing effective waste management programs designed to meet the requirements of AB 939 and City

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 City chooses to pursue. Each of the programs outlined in this alternative would require resources from the City 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. The costs to the private sector of the regulatory programs outlined in this alternative are unknown.

End Uses. See section titled "Market Conditions."

Public vs. Private Operation. Not applicable.

ALTERNATIVE 3 - 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 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.

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 vehicle have a scale and some type of a recordkeeping system to track the weight of the wastes by customer.

This alternative is evaluated below to determine whether it is appropriate for the City, 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 jurisdiction's governing body.

Consequences to the Waste Stream. Rate structure modifications would be designed to encourage source separation and recycling. Some shifting of wastes towards more recyclable waste types will be unlikely. 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 waste stream such as yard wastes 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. Implementation of this alternative could occur within a period of several months to a year and is well within the short-term planning period. 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 City. Exceptions will occur when the plans and policies of the City 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 City 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 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 City (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

End Uses. See section titled "Market Conditions."

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

ALTERNATIVE 4 - MARKET DEVELOPMENT

Several options for market development for recycled materials are available to the City that address the objectives outlined in the section titled "Objectives." These options include participation in State-wide efforts sponsored by the California Integrated Waste Management Board, use of public education and information programs to promote the use of products using recycled materials, and local procurement ordinances. This alternative will focus on local procurement ordinances. Public education efforts by the City will have to be aggressive and extensive to ensure successful source reduction, recycling, and composting efforts, and are therefore covered in a separate component.

Local procurement ordinances involve adopting a procurement policy for the City specifying that one or more of the following criteria be considered in purchasing decisions: durability, recyclability, reusability, and recycled material content. Additionally, the City could specify that any business or organization holding a contract with the jurisdiction would have to have a recycling program in place and provide products or materials according to the above criteria. The City could adopt purchasing preferences and establish set-asides for recycled products or product with an established percentage of recycled material content.

This alternative is evaluated below to determine whether it is appropriate for the City, 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.

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 to 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 City.

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 City 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 timeframe 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 conflicts does not pose any conflict with current plans, policies, and ordinances for the City regarding low-bid purchasing.

Institutional Barriers. Purchasing and procurement programs across public agencies will have to be coordinated in order to achieve a City-wide impact from a procurement program. While purchasing and procurement itself is often centralized within the City'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 City 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.

ALTERNATIVE 5 - 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. For example, the City could re-route commercial collection runs in order to preserve the integrity of recyclables destined for a mechanized recovery facility. This would enable the separate collection of wet wastes from grocery stores, for example, and dry wastes from other businesses.

This alternative is evaluated below to determine whether it is appropriate for the City, 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 mate-

rials 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 City 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 City may wish to consider whether a transfer station or material recovery facility would enhance the program.

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

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 City.

End Uses. See section titled "Market Conditions."

Public vs. Private Operation. The programs contemplated under this alternative could be implemented by either public or private entities.

4.5 SELECTION OF RECYCLING 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 City presents the results of the qualitative evaluation of the alternatives presented in the previous section. To accomplish this, the City has applied an assessment of whether or not each alternative is appropriate to the City's needs and assigned each alternative a ranking in order to select various alternatives. In selecting among alternatives, the City 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, and solid waste management system), and (2) the degree to which the alternatives complement each other and form a coherent, comprehensive, and cost-effective package.

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 City has selected the following programs and alternatives:

Residential Alternatives

- Continue a residential curbside collection program for recyclables.
- Review a mobile collection system for recyclables.
- Expand a multi-family dwelling program for recyclables.

Non-Residential Alternatives

- Continue a commercial/industrial recycling program.
- Expand a commercial front load collection program for recyclables.
- Continue a program to divert inert solids generated from public works and construction/demolition projects to a materials processor.

Residential and Non-Residential Alternatives

- Develop a drop-off center for recyclables.
- Continue a program of regulatory approaches such as zoning, building code, and land-use requirements to promote recycling activities.
- Continue a market development program through a local procurement program for products with recycled material content.
- Review a program of materials handling methods for recyclables.
- Continue a variable rate structure for both commercial and residential collection.
- Continue City-sponsored programs aimed at recycling throughout City offices and operations.
- Continue multi-jurisdictional approaches to recycling such as public education, disposal fees, and market development.

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 City has selected the following programs and alternatives:

Non-Residential Alternatives

- Continue a commercial/industrial recycling program.
- Continue a program to divert inert solids generated from public works and construction/demolition projects to a material processor.

Residential and Non-Residential Alternatives

- Continue a program of regulatory approaches such as zoning, building code, and land-use requirements to promote recycling activities.
- Continue a market development program through a local procurement program for products with recycled material content.
- Review a program of materials handling methods for recyclables.
- Monitor efforts at the state level to encourage recycling, including financial and economic incentives, public education efforts, and other programs.

Cost

It is estimated that expanding the recycling program to include multi-family collection will cost $267,000 per year.

Market Conditions

Recycling requires more than the separation and collection materials; viable markets must exist for the recovered materials. This section addresses the existing market conditions relevant to the City, 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 City 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 City is in the fortunate position of being able to take advantage of the contracts that Los Altos Garbage Co. has established with various processors nationwide, which amounts 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 other 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 is about $15 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 City is in Santa Clara and San Jose, as well as other mills in San Leandro and Antioch.

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 defined in AB 939 as 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 City .

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 City are Jefferson Smurfit and Weyerhauser in San Jose and DAI EI 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 remelted 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[1] and is worth approximately $3 to $4 per pound. Even this small amount of tin can cause contamination in steelmaking. For this reason, detinning 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.[2] Steel can recycling is expanding, due in part to

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[1] 3 "A Force in Detinning," by Tom Watson, *Resource Recovery*, January/February 1989, p. 18.

[2] Watson, p. 18.

increased participation by steel mills and detinning mills in collecting and purchasing used steel cans.[3] This is despite aggressive efforts by the aluminum can industry to enter the steel-dominated food can market.[4]

The major detinning 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.[5]

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 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.

Effective February 3, 1992, glass cullet is purchased by Golden State Glass Recycling in Newark (at the CIRCO Glass Company facility) and California CRINC (at the former NoCal Glass Beneficiation, Inc. facility) in San Leandro. Neither charges a processing fee to take the, materials. The glass market has become problematic for many recyclers recently due to the increased quality standards being imposed and the request 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 to 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

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

4 Misner, p.70.

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

recycling will grow and new markets will develop.

Most soda containers are made out of polyethylene teraphthelate (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 fiberfill, 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 basecups, 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.[6] It is also used in the manufacture of rigid items, such as food storage containers and flexible lids.[7] 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.[8]

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

7 "All Plastics Are Not Created Equal," by Jerry Powell, *Resource Recycling,* May 1990, p.41.

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

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.[9]

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.

The primary market for telephone books is overseas, as over 90% of the telephone books collected in this year's recycling drive was sold to overseas market.

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 Resource Management 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.

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

4.6 PROGRAM IMPLEMENTATION

The Public Works Department will be responsible for implementing the selected alternatives; the specific tasks necessary to achieve full implementation of the selected alternatives; and an implementation schedule.

The City will adopt an anti-scavenging ordinance to deter the unauthorized removal of recyclables from recycling collection programs.

Residential Sector

Since June 1989, the franchised hauler, Los Altos Garbage Co. has been providing a city-wide curbside recycling service with the exception of hillside and multi-family residences.

Collection is on a bi-weekly basis, with glass, metal, and plastic placed in a rigid plastic ungarbage container. Newpaper is bundled separately and placed with the ungarbage container. Used motor oil is collected in one-gallon containers.

Residential recycling service will be expanded to hillside and multi-family residences in the fall of 1992. Additional materials, such as magazines and HDPE plastic, could be included in the program as markets emerge.

Educational materials that address the residential curbside recycling program will be developed in 1992. Information materials will be developed in order to increase the number of households participating in the program and reinforcing the different materials that can be diverted.

In the short-term, the goal will be to increase diversion from 8% to 11% by weight of the total wastestream.

Commercial Sector

Recycling programs in the commercial sector are provided by the franchised hauler, Los Altos Garbage Co., and various independent recyclers collecting source separated materials.

Companies, such as Apple Computers, Hewlett Packard, Tandem, and Measurex, have contracted with independent recyclers to collect high-grade paper, cardboard, aluminum, glass, styrofoam, wood pallets, toner cartridges, and other source separated materials.

Los Altos Garbage Co., the franchised hauler, also provides single source separated collection program together with a mixed

recyclable collection program and a mixed paper collection program.

- Mixed recyclable constitutes recyclable material with contamination level of no more than 10% of solid waste matter.

- Mixed paper program - collection of colored paper, newspaper, junk mail, magazines, flyers, envelopes, catalogs, cardboard, stationery in various collection bins.

Educational material that address commercial recycling program will be developed in 1992. Information materials will be developed in order to increase the number of businesses participating in the program.

In the short-term, the goal will be to increase diversion from 12% to 18% by weight of the total wastestream.

4.7 MONITORING AND EVALUATION

To ensure that the selected recycling alternatives are meeting the goals and objectives of this component, the City 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 City'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, 2, and 3; Objectives 4,5, 6, and 7; and Objectives 8, 9, and 10.

Objective 1: Increase participation in residential recycling programs.

Objective 2: Expand participation in multi-family dwelling recycling programs

Objective 3: Increase participation in commercial recycling programs.

Monitoring Method: An annual survey of residences and commercial businesses 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 4: Expand number of material types collected from the residential and commercial sectors.

Objective 5: Expand a diversion program for materials currently collected via industrial debris boxes.

Objective 6: Divert inert solids generated by the City's department of public works, municipal utilities, and capital improvement projects.

Objective 7: Separate additional waste types from the residential and commercial waste streams.

Monitoring Method: Further waste characterization studies will 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 material types recycled, as well as program effectiveness. This will be aided by improved recordkeeping on the quantity, waste type, and generators of recovered materials.

Objective 8: Increase local demand for materials made from post-consumer waste.

Objective 9: Expand plastics recycling operations to include a wider variety of polymer types

Objective 10: Modify refuse collection practices to optimize the economics of recycling operations.

Monitoring Method: An annual survey of businesses and City government will be conducted to monitor procurement practices and, specifically, to identify increases in the purchase of recyclable materials and products, as compared to the previous year's purchasing practices. In addition, the City will continually monitor national trends in recycling with respect to new technologies, processes, and market development.

Written Criteria. The City will prepare annual reports describing the findings of the monitoring activities described above. The report 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 Department of Public Works.

Funding Requirements. Funding for the monitoring and evaluation program described in this section will be provided by the City through Resource Recovery Fund. Funding for this program includes the costs of (1) administrative activities, (2) recordkeeping, (3) program monitoring and surveying, (4) tracking of survey results, and (5) annual report-writing.

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 these need to be increased to broaden awareness of, and participation in, recycling programs.
- Evaluate alternative markets for recovered materials.
- Provide incentives to the commercial/industrial sector for recycling.
- Address issues resulting from surveys that could potentially be affecting diversion goals.
- Consider regulatory programs or mandatory programs such as:
  - City 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 [10] (January/February 1991)

1. CIRCO Recyclers
   (Commercial Recycler)
   6565 Smith Avenue
   Newark, California 94560
   (415) 791-6980

2. Elder's MPI, Inc.
   (Reclaimers ofPreciousmetals)
   1919 Lundy Avenue
   San Jose, California 95131
   (408) 432-8870

3. Foothill Disposal Company
   (Collector/Hauler, Buy-Back Center)
   935 Terra Bella
   Mountain View, California 94043
   (415) 967-3034

4. Harris Recycling, Inc.
   (Collector/Wood Waste Chipper)
   787 "E" North King Road
   San Jose, California
   (408) 259-2290

5. Oakland Plastic Sales
   9733 San Leandro Street
   Oakland, California 94603
   (415) 562-6033

6. Reynolds Aluminum
   (Buy-Back Center)
   1303 Story Road
   San Jose, California
   (408) 651-6808

7. Sears Automotive Center
   (Commercial Recycling)
   10101 N. Wolfe Road
   Cupertino, California 95014
   (408) 255-0222

8. Security Shredding Co., Inc.
   1045 Commercial Court
   San Jose, California
   (408) 452-5996

9. St. Francis Cabrini Church
   15333 Woodard Road
   San Jose, California 95124
   (408) 371-3090

10. Trinie Martin Recyclers
    (Buy-Back Center)
    8565 1/2 Monterey Road
    Gilroy, California 95020
    (408) 842-2565

11. West Coast Metal Processing, Inc.
    (Broker/Scrap Metal Dealer)
    483 Salmon Way
    Hayward, California 94544
    (415) 489-8141

12. Free Flow Packaging Corp.
    (Buy-Back Center)
    1093 Charter Street
    Redwood City, California
    (415) 364-1145

13. Raisch Products
    (Asphalt/Concrete Recycler)
    P.O. Box 543
    San Jose, California 95106
    (408) 227-9222

14. Ciardella Garden Supply, Inc.
    (Garden Materials Recycler)
    2027 E. Bayshore
    Palo Alto, California
    (415) 321-5913

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[10] The type of business is indicated in parentheses, when available.

15. Waste Fibre Recovery
(Demolition Debris Recycler)
1900 W. Winton Avenue
Hayward, California 94545
(415) 732-wood

16. Contain-A-Way
(Buy-Back Center)
20/20 Recycle Centers
1731 Pomona Avenue
Corona, California 91720
(714) 279-2200

17. Encore
(End Market/Manufacturer)
860 S. 19th Street
Richmond, California 94804
(415) 234-5670

18. Oxford Tire Recycling
(Tire Recyclers)
33950 7th Street
Union City, California 94587
1-800-992-3553

19. Goodwill Industries
of Santa Clara Co.
(Buy-Back Donation Center)
1080 North Seventh Street
San Jose, California 95112
(408) 998-5774

20. Western Recycling
(Scrap Metal Dealer)
91 E. 4th Street
Morgan Hill, California
(408) 779-1781

21. L & K Debris Box Service
(Commercial Hauler/Wood Waste Chipper)
1313 Armstrong Street
San Francisco, California 94124
(415) 824-4322

22. EMS
(Broker)
231 Fallon Street
Oakland, California 94607
(415) 763-0101

23. Battery Center
(Buy-Back and Donation Center)
1552 Old Bayshore Highway
San Jose, California 95112
(408) 453-5438

24. Town of Los Gatos
(Donation Center)
P.O. Box 949
Los Gatos, California 95030
(408) 354-6809

5. COMPOSTING COMPONENT

5.1 INTRODUCTION

A well designed and operated composting program can play a major role in the overall success of an integrated waste management strategy. As such, composting will be a major contributor to the City's goals of 25% source reduction and recycling by 1995, and 50% by 2000. Composting can be defined as 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 approximately 21% of the City of Cupertino's municipal solid waste consists of compostable material, therefore, composting has the potential to become 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 could 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 implementation, evaluation, 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.

5.2 OBJECTIVES

This section describes short- and medium-term objectives for the City's 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 5% by weight of the total waste stream generated.
- Develop the collection and processing infrastructure to deal with the city's source separated yard and wood wastes.
- Inform and educate residents about how to participate in the yard waste collection program.
- Identify particular sub-groups of potential end users and their anticipated product quality and quantity demands.
- Establish a yard waste drop-off site at the composting facility and/or at alternative convenient locations.
- Develop a plan for commercial and institutional food and food processing waste collection in anticipation of medium-term food waste composting.
- Investigate the feasibility of implementing full-scale mixed MSW composting, sewage sludge composting, or mixed MSW/sludge co-composting for medium- to long-term implementation.

- Encourage countywide cooperative effort to establish a processing facility and in marketing the compost end products.
- Encourage county and municipal departments to use compost products generated by the program, and inform residents of their availability.
- Study the use of yard waste compost for landfill cover.
- Study the effect of collection and disposal rates on quality of compostable materials collected.
- Encourage, via the source reduction component, residential backyard composting.

Medium-Term Objectives

Ojectives for the medium-term planning period include:

- Divert 11% by weight of the total generated waste stream.
- Refine the yard and wood waste collection and processing systems.
- Study food and food processing waste collection and composting.
- Study the feasibility of co-composting yard waste with other organic residues, including sewage sludge.
- Divert self-haul yard waste into composting program.
- Implement full-scale mixed MSW composting, sewage sludge composting, or mixed MSW/sludge co-composting.
- Implement program to encourage use of compost by parks and highway departments and other public entities.

5.3 EXISTING CONDITIONS

The results of the disposed waste analysis indicate that for the year 1990, disposed yard waste amounted to 7,545 tons; wood waste, 2,341 tons, food waste 3,063 tons, and other compostable materials, 1,330 tons. The source of the material was the residential, commercial, and industrial sectors. The amount of compostable

materials generated by each of the sectors in 1990 was as follows: residential, 5,539 tons; commercial, 4,229 tons; industrial, 4,343 tons; self haul, 170 tons.

The City currently is in the process of implementing a residential curbside yard waste collection program. The waste will be transported to Zanker Road Landfill for composting and recycling. This program will process 2,619 tons of yard waste per year into compost in the short-term.

Compostable materials are currently being composted and recycled at the following sites:

Name:	Zanker Road Landfill
Location:	San Jose
Method of Processing:	composting, recycling

5.4 PROGRAM ALTERNATIVES

Collection Options

The highest quality compost products are produced from the separate collection of compostable materials. The materials can be collected separately for subsequent processing into usable end-products through curbside collection, a drop-off program, or both. Collection programs should be accompanied by aggressive promotion of source reduction methods, such as home composting. A description of source reduction programs is presented in Section 3.

Residential Curbside Collection

Important considerations in the curbside collection of yard waste include: identification of the types of yard waste to be collected and the frequency of collection; method of set-out for yard waste; and type of collection vehicle.

There are three main options for setting out yard waste in a residential curbside 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) debagging 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 debagging 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 necessitates 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 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.

Commercial Program

A program similar to residential curbside collection would offer multifamily dwellings, business, and civic yard waste generators the opportunity to divert yard waste from the landfill.

The program could also include other wastes that could be composted, such as food wastes and manures. Collection of these materials generally is conducted by using bins ranging in size from 2 to 40 cubic yards or by means of dump trucks.

Food wastes comprise a significant portion of the overall waste stream. If properly managed, co-composting food wastes with yard waste would not introduce serious complications. These wastes have a high moisture content and must be promptly and properly mixed with bulky yard waste. This material will result in a high-quality compost.

For programs using manure as a composting feedstock, proper attention must be given to limiting the manure quantities, minimizing the storage time of the food wastes, and maintaining aerobic

decomposition to minimize vector attraction and odor. In certain instances, manure may also contain chemicals which are included in feed supplements. It would be prudent to test the manure for undesirable chemical compounds.

Co-composting of yard wastes with sewage sludge is practiced in several operations in the U.S. The introduction of sewage sludge complicates the composting operation. Processing technologies, especially those of the pre-processing and active composting stages, require greater refinement than is necessary in a yard waste only operation. Site construction costs would increase, based on the need for more extensive paving, water runoff collection, and a larger buffer zone. Facility permitting would become a more complex process, due to potential environmental and health impacts that are more severe, or more difficult to mitigate, than those for yard waste composting.

Permanent Drop-Off Centers

A drop-off program relies on residents and/or private commercial haulers to transport clean (segregated) 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.

Key planning features for yard and wood waste drop-off sites 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 sites.

- Instructional signs should be placed at sites to indicate acceptable materials, unloading location, and site hours.

- Acceptable materials should include leaves, grass clippings, brush, and branches less than 6 in. in diameter. Stumps and branches over 6 in. in diameter, and construction and demolition wood should not be accepted.

- The 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.

Mobile Drop-off Centers

These centers can be established using large collection debris boxes (approximately 40 cu yd capacity) in neighborhoods for short, scheduled periods of time. When full or when appropriate to be moved to the next neighborhood, trailers are first emptied at a centralized composting or pre-processing aggregation site.

Residential Onsite Composting

Onsite composting can be defined as the process of managed decomposition of organic materials on one's own premises that results in the creation of a usable horticultural product.

Onsite composting in residential areas is also known as "home" or "backyard" composting. Yard waste can be composted successfully at home fairly easily with minimal odors or disturbance from animals. Often, yard waste is composted together with food scraps. This works well, provided that the composting is managed properly and that meat by-products are excluded from the compost pile. This approach is generally most suitable for single- or two-family residences which have available space in their backyards.

Source reduction through home composting can be encouraged by the implementation of a pay-per-bag system for trash collection. Those who engage in composting at home will reduce their volume of waste, and consequently reduce their disposal costs. The quantities of yard waste requiring disposal can also be reduced by leaving cut grass on the lawn, although this is technically not considered composting.

According to the regulations, onsite composting is a form of source

reduction. Further information on onsite composting is provided in the source reduction component.

Compost Processing Options

Three stages of processing can be utilized at composting operations: pre-processing, composting, and post-processing. For source separated compostable materials, pre-processing generally involves shredding and/or screening of the incoming materials to result in a compost feedstock of a particle size that would compost more readily. As discussed earlier, the processing involved for a mixed MSW feedstock is more involved. The composting stage involves the biodegradation of the material and is discussed in the following paragraphs. Size reduction and/or screening are used in the post-processing stage to produce a compost or mulch product with a more consistent particle size.

There are several composting methods, ranging from low to highly complex technology. The most appropriate technology depends upon the composition of the feedstock, the capital and labor requirements, and the existence of suitable markets for the end products. It is likely that a combination of technologies may be the most advantageous. A brief description of available technologies follows:

The **turned windrow** method of composting calls for stacking wastes into elongated piles known as windrows. The dimensions of the windrows can be adapted to the particular conditions and available equipment, but in general, they are roughly trapezoidal in cross-section and sized to provide insulation, while avoiding compaction of the material. Satisfying these criteria usually results in windrows from 8 to 15 ft wide, and 5 to 10 ft high, and whatever length is convenient to the site. Aeration is accomplished by agitating or turning the piles using a front-end loader or specially designed turning equipment. The turning frequency depends on many factors, including the nature of the feedstock, its particle size, moisture content, and the desired rate of decomposition. Generally, but not necessarily, the more frequent the turning, the more rapidly the material decomposes. It is extremely important that site managers monitor temperature, moisture, and oxygen content of the piles to ensure that the materials decompose aerobically and rapidly, without the production of offensive odors. This method of composting generally requires between 6 and 18 weeks to finish.

The major advantages of this method are its ability to process large quantities of materials at a cost competitive with other solid waste disposal options, while producing a marketable and useful product. Turned windrow composting can often be

accomplished at existing processing facilities, without very large capital expenditures, and within the stipulated time frame. Potential disadvantages that must be managed are the dedication of relatively large land areas to the project, the possible production of offensive odors, the intensive pile management required to maintain favorable conditions, and the formation of leachate.

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. However, in practice, it is advisable that some mechanical turning of the piles be carried out to promote complete decomposition and avoid anaerobic pockets. The complexity and expense of this method is generally not justified to compost leaves, grass and other yard wastes. It is appropriate, and commonly used, for stabilization of sewage sludge, and is being applied in dedicated mixed MSW composting projects.

In-vessel composting entails the use of fully or partly enclosed vessels in which decomposition takes place under closely monitored conditions. Its relatively high capital and operating cost makes this method appropriate only for the decomposition of highly putrescible feedstocks, or feedstocks that could be the source of offensive odors such as food wastes. This method of composting is capable of producing a high quality end-product, but its expense makes its unattractive as a primary management option for yard wastes.

Size reduction of brush and wood waste (shredding and chipping), although not strictly composting, can be an important and useful element of a yard waste recycling program, or a stand-alone means of handling woody wastes, or both. Small trees, branches, brush, broken pallets, clean used lumber, and other woody waste can be used, after size reduction, either directly as mulch or wood chips, or, if adequately reduced in size, included in compost piles. It is difficult to compost woody wastes without prior size reduction because the relatively high carbon-to-nitrogen ratio slows the decomposition process to impractical time periods. Shredding of woody wastes can generally be implemented in the short-term, with relative ease, and a minimum of uncertainty. No major new facilities should be needed for the operation.

Siting Options

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.

Market Development

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.

Local markets such as homeowners, municipal and county agencies, nurseries, sod farms, and landscaping supply firms are examples of potential end users. It will be necessary to determine how the end-products will be distributed (i.e., bagged and/or bulk) and at what, if any, cost.

The plan will also include development of markets outside the immediate area. The City will explore the possibility of cooperating with other jurisdictions to market end-products. Overseas markets will be explored.

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 city-generated compost and other end products. The Public Information and Education 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 will be developed and implemented. This will be an important aspect of the overall composting component because the city must be able to dispose of the finished products.

Evaluation of Rates

In order to improve the overall quality of end-products, the city, during its annual review of rates, will 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.

5.5 EVALUATION OF ALTERNATIVES

Residential Curbside Collection

Advantages of 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 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.

Residential yard waste comprises a significant portion of the overall waste stream. Diversion of any part of this waste stream will result in the reduction of solid waste going to landfills.

Commercial Collection

Compostable materials generated by the commercial/industrial sector include yard waste, wood waste, and food waste. The advantages and disadvantages for segregated collection of compostable waste from commercial and industrial generators are similar to those outlined under the evaluation of alternatives for residential curbside collection. In addition to the considerations mentioned previously, separate or commingled compostables collection of food waste may require the use of specialized collection equipment. The collection of food waste will also require changes in the way employees handle food waste disposal in restaurants and at other locations generating substantial quantities of food wastes. The local health department may place requirements on generators of food wastes participating in the food waste collection program with respect to the on-site storage of food waste.

Permanent Drop-Off Centers

A permanent drop-off program requires a minimal amount of financial investment and staff time, and can be implemented relatively quickly. Yard waste and wood wastes are self-hauled by small private haulers or individual residents to either the composting site or to a local drop-off center.

It is anticipated that a drop-off site could be established at the landfill and/or transfer station, and perhaps elsewhere, without the need to build new facilities. Site development costs are usually low. A materials recovery facility would also be a good location for a drop-off center.

To encourage self-haul, residents should be allowed to use the drop-off site at no or minimal cost, and could be given a voucher for finished compost or wood chips. Self-hauling reduces overall

costs of collection.

Materials included in such a drop-off program could be limited to bulk leaves if specialized composting equipment (e.g., shredder) is not yet available for use at the composting facility.

Mobile Drop-Off Centers

Mobile Drop-Off Centers, using large collection trailers in neighborhoods for short, scheduled periods of time, can be an attractive alternative, particularly in areas with lower population densities or dispersed quantities of compostable materials. The cost generally ranges between that associated with curbside collection and permanent drop-off programs. Participation may need to be limited to residential generators to prevent commercial self-haulers from overwhelming the facilities.

In more rural areas, where residential users self-haul yard and wood wastes, the convenience of not having to transport to the landfill or transfer station will increase participation and increase diversion of materials.

Some disadvantages are: 1) participation will be less than that of a curbside program; 2) location of centers might require changes in zoning ordinances; 3) the center would need to be staffed to prevent unauthorized disposal of unacceptable materials; and 4) additional equipment will be needed for collection and transportation.

Residential Onsite Composting

Backyard composting can be an inexpensive yard waste management alternative. It eliminates the public and private costs of collection, transport, tipping, and processing. Stopping the flow of materials before they become waste products that require outside handling is gaining recognition as a viable yard waste management option.

However, if backyard composting piles are not properly managed, they can emit unpleasant odors, attract insects and small animals, and become a nuisance to the neighborhood.

One way to stimulate interest in residential onsite composting and promote proper management is through public education and publicity. 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.

Refer to the source reduction component for additional information.

Processing Options

Turned Windrows

Turned windrow composting has minimal associated hazards; odors from poor site or process management is the most frequently mentioned concern. Other hazards, such as flow of runoff into surface water, generally can be controlled effectively with simple steps.

This method of composting can accommodate changing economic, technological, and social conditions rapidly and effectively. Turned windrow composting can be implemented in a short time frame, partly since site improvements are usually minor and new facilities usually need not be constructed. This approach supports local source reduction and recycling efforts, and can be effectively developed by existing local institutions. Turned windrow composting is preferred over other methods for composting yard waste.

One common approach is to utilize a front-end loader to form and turn windrows. Alternatively, specialized equipment (e.g., a windrow turner) can be used to turn and aerate piles effectively and rapidly. Rudimentary operations tend to cost $10 to $20/ton (amortized capital and operating expenses), while sophisticated operations often cost approximately $30 to $40/ton. The cost of many operations nationwide is between these extremes.

Aerated Static Pile

Composting of strictly yard waste via the aerated static pile method is rare. Expense and needless complexity render this method generally inapplicable to yard waste. Aerated static piles are more commonly used to compost sewage sludge.

Aerated static pile composting has minimal associated hazards; odors from poor site or process management is the most frequently mentioned concern. Other potential hazards, such as build-up of ammonia gas in indoor facilities, generally can be controlled effectively by adequate ventilation and process monitoring.

The static pile method can accommodate changing economic, technological, and social conditions relatively quickly and effectively, and does not interfere with or impede progress toward the State's waste reduction and recycling goals. A program using

this method can be implemented in an intermediate time frame; construction of a new facility is usually needed. Institutional barriers to its development are few.

Given the same feedstock, static and turned windrows produce identical products if both operations are managed correctly. Typical combined capital and processing costs for a 10,000 ton/year facility are approximately $25 to $50/ton.

In-Vessel Composting

Advantages of this method include rapid processing, avoidance of weather-related problems and inefficiencies, and more complete process and odor control. High capital costs and potential for system failure render this option not viable unless more than yard and wood wastes are composted and a rapid throughput time is employed. This technology cannot be implemented in the short-term, and is not particularly flexible in response to changing economic, technological, and social circumstances. Construction of a new facility is essential to support program implementation.

This approach may impede progress toward the State's waste reduction and recycling goals, since it cannot be implemented in the short-term. In addition, institutional barriers may be significant, unless the facility is operated privately. Typical combined capital and processing costs for a 10,000 ton/year facility are approximately $40 to $60/ton.

Brush and Wood Waste Processing

Shredding or grinding of woody yard waste supports local source reduction and recycling efforts, and can be implemented in the short-term with relative ease and a low level of uncertainty. However, finished products that are sold as fuel cannot be counted towards the state's 25% diversion goal in 1995. They can be counted for up to 10% of the state's 50% diversion goal in 2000.

The technology can be adapted to adjust to technological, social, and economic conditions. Hazards from flying projectiles can be minimized by locating the size reduction processing site at least 300 ft from public access. No new facilities would be required for the operation, although a covered structure for the equipment would be desirable.

Suitable grinders, both mobile and stationary, can process approximately 5 to 10 tons/hour. Regular maintenance and unplanned downtime for certain types of grinders can be significant.

Amortized capital costs (excluding labor and other operating costs) generally translate into a cost of approximately $10 to $20/ton for a 10,000 ton/year operation.

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 location (if privately-owned and located in another jurisdiction).

CEQA Requirements

As a component of 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. 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, less expensive product.

The following are potential end-users of compost products in 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.

5.6 SELECTION OF A PROGRAM

Short-Term

In order to meet short-term goals, an estimated diversion of 5% (by weight) of the total generated waste stream will be necessary. The programs to achieve this goal are:

- Initiate the residential curbside yard waste collection program with the material going to the Zanker Road Landfill site.

- Expand a drop-off program for yard wastes at the Zanker Road Landfill or other existing site, focusing on self-haulers.

- Initiate a marketing program for the distribution of end-products. Compost, mulch, and wood chips will be marketed as horticultural products. Some wood chips could be marketed as a fuel in order to provide financial stability and flexibility to the program. A successful marketing program could increase revenues to offset costs.

- Disseminate public education and publicity materials regarding yard and wood waste drop-off and curbside collection programs, 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.

- Initiate commercial yard waste program.

Medium-Term

For the medium-term, an estimated diversion rate of 11% of the total generated waste stream will be necessary. All programs selected in the short-term period will be continued into the mid-term period. The programs to achieve this goal are:

- Study the effect of collection rates on assuring high-quality compost products. Production of high-quality end-products is essential in marketing and the generation of revenues. Rate adjustments for those who source separate yard waste or other compostable waste, and divert high quality compostable feedstocks will have a positive impact on the overall goal of producing quality end-products.

- Initiate a feasibility study to co-compost yard waste with sewage sludge or other organic materials.

Cost

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 $600,000 to $700,000 per year.

5.7 PROGRAM IMPLEMENTATION

The Public Works Department will be responsible for implementing the compost program. Table 5-1 shows implementation schedule.

Residential

A pilot program will begin the summer of 1992 for approximately 10% of the community (1000 residences).

Residents of the pilot area will be given 96-gallon toters for yard waste collection. Grass clippings, prunings, and other plant debris will be deposited in the toter and collected by-weekly (same day as co-mingled recycling containers) by the franchised hauler, Los Altos Garbage Co.

Actual field data will assist in verifying the equipment and manpower needed, and the costs of implementing the yard waste program.

A public hearing on the yard waste program is scheduled in September 1992.

Educational materials that address the residential yard waste collection program will be developed in 1992. Public will also be informed as to how they can obtain compost and mulch from the program.

In the short-term, diversion of yard waste will be 5% by weight of the total wastestream.

Processing Facility

Zanker Road Landill will process the City's yard waste. See pages 6-4 and 6-5 for information regarding Zanker Road Landfill..

This program will process 2,619 tons of yard waste per year into compost in the short-term.

5.8 MONITORING & 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 reject 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;
- Other supplementary measures as deemed necessary or desirable.

A waste generation study will be undertaken by Cupertino 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 Cupertino in 1990.

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:

- Less than 25% diversion of yard and wood waste, unsatisfactory;
- Between 25% and 50% diversion of yard and wood waste, needs improvement;
- Between 50% and 75% diversion of yard and wood waste, satisfactory;
- Greater than 75% of yard and wood waste, effective.

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. The City 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 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.

Table 5 - 1

COMPOSTING IMPLEMENTATION SCHEDULE

TASK	RESPONSIBLE AGENCY	IMPLEMENTATION DATE	YEARLY COST
SHORT TERM			
Initiate pilot yard waste collection program	LAGCO/CITY	JUNE 1992	INCLUDED IN PROGRAM COST
Begin citywide collection for residential yard waste	LAGCO/CITY	OCTOBER 1992	$600,000
Public Education/Information Programs	LAGCO/CITY	ONGOING	INCLUDED IN PROGRAM COST
Review Drop-off Program for self-haul	LAGCO/CITY	JUNE 1993	INCLUDED IN PROGRAM COST
Develop marketing program for the distribution of end products	LAGCO/CITY	ONGOING	INCLUDED IN PROGRAM COST
Develop commercial yard waste collection program	LAGCO/CITY	JUNE 1994	INCLUDED IN PROGRAM COST
MEDIAN TERM			
Opptimize residential yard waste collection	LAGCO/CITY	ONGOING	INCLUDED IN PROGRAM COST
Expand Commercial yard waste collection program	LAGCO/CITY	JUNE 1995	UNKNOWN

LAGCO = LOS ALTOS GARBAGE COMPANY
CITY = CITY OF CUPERTINO

6. SOLID WASTE FACILITY CAPACITY COMPONENT

6.1 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 City of Cupertino 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 City. It includes projections of the City's waste capacity needs for the next 15 years, and describes how the City 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 City's future disposal facility capacity needs.

The Component also identifies disposal facilities that will be closed in the next 10 years, and describes plans to establish new or expanded disposal facilities during the next 10 years.

6.2 EXISTING PERMITTED SOLID WASTE DISPOSAL FACILITIES

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 Landfill, Incorporated. 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.

Owens-Corning Fiberglas Corporation owns and operates a non-permitted disposal site in northern San Jose for the disposal of wastes generated at their Santa Clara operations. The facility is not open for public use and is currently undergoing permitting procedures through the City of San Jose, LEA for the site.

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.

In 1984, the City 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.

Newby Island Sanitary 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 owned and operated by Zanker Road Landfill, Incorporated, a wholly owned subsidiary of Norcal Solid 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 Landfill reopened it 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).

6.3 DISPOSAL CAPACITY NEEDS PROJECTION

The disposal facility capacity needs projection provides an estimate of the disposal capacity (in cubic yards/year) that is needed to accommodate projected solid waste for a 15-year period commencing in 1991 (or date of adoption of SRRE). Sec. 2.0 of this 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 City's of projected capacity needs over the next 15 years.

Capacity Needs Projection Equation:

$$\text{Annual Capacity}_{\text{Year n}} = [(G + I) - (D + TC + LF + E)_{\text{Year n}}]$$

where:

G = the amount of solid waste projected to be generated in the City of Cupertino.

I = the amount of solid waste which is expected to be imported to the jurisdiction for disposal in permitted solid waste disposal facilities through interjurisdictional 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.

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:

$$\text{Capacity Needed Year 1} = [(\text{waste generated} + \text{waste imported}) - (\text{waste diverted} + \text{waste transformed (burned)} + \text{landfill capacity available} + \text{waste exported})]$$

Results of the solid waste disposal facility needs projection are shown in Tables 6-1 and 6-2. These results indicate that the City of Cupertino 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.

6.4 DISPOSAL FACILITY PHASE-OUT OR CLOSURE

The city's current contract with Newby Island landfill, together with achievement of the projected waste diversion goals, will

provide adequate disposal capacity through 2018.

By Resolution No. 7747, the City entered into an agreement with International Disposal Corporation of California, a Subsidiary of Browning-Ferris Industries, Inc., for a long-term disposal of municipal solid waste, through 2018. A copy of this agreement is presented at the end of this section.

Total tonnage allocation for the City of Cupertino is guaranteed 2,050,000 tons.

6.5 NEW OR EXPANDED DISPOSAL FACILITIES

There are no plans to establish a new disposal facility for the City of Cupertino during the planning period.

TABLE 6 - 1

CITY OF CUPERTINO
SOLID WASTE DISPOSAL FACILITY CAPACITY NEEDS

CONTINUATION OF CURRENT PROGRAM						
YEAR	ANNUAL WASTE GENERATED	ANNUAL WASTE IMPORTED	ANNUAL WASTE DIVERTED	ANNUAL WASTE TRANSFORMED	ANNUAL WASTE EXPORTED	REMAINING LANDFILL CAPACITY
1990	51,593	0	8,800	0	42,793	
1991	45,436	0	9,044	0	36,392	
1992	46,663	0	9,274	0	37,389	
1993	47,923	0	9,535	0	38,388	
1994	49,169	0	9,783	0	39,386	
1995	50,398	0	10,016	0	40,382	
1996	50,599	0	10,063	0	40,536	
1997	50,802	0	10,112	0	40,690	
1998	51,005	0	10,161	0	40,844	
1999	51,209	0	10,210	0	40,999	
2000	51,388	0	10,233	0	41,155	
2001	51,440	0	10,240	0	41,200	
2002	51,491	0	10,245	0	41,246	
2003	51,543	0	10,252	0	41,291	
2004	51,594	0	10,257	0	41,337	
2005	51,646	0	10,264	0	41,382	

* ALL WASTE ARE IN TONS

** ALL EXPORTED WASTE ARE TAKEN TO NEWBY ISLAND LANDFILL IN SAN JOSE

TABLE 6 - 2

CITY OF CUPERTINO
SOLID WASTE DISPOSAL FACILITY CAPACITY NEEDS

IMPLEMENTATION OF SRRE						
YEAR	ANNUAL WASTE GENERATED	ANNUAL WASTE IMPORTED	ANNUAL WASTE DIVERTED	ANNUAL WASTE TRANSFORMED	ANNUAL WASTE EXPORTED	REMAINING LANDFILL CAPACITY
1990	51,593	0	8,800	0	42,793	
1991	45,436	0	9,044	0	36,392	
1992	46,663	0	13,658	0	33,005	
1993	47,923	0	14,827	0	33,096	
1994	49,169	0	15,817	0	33,352	
1995	50,398	0	17,290	0	33,108	
1996	50,599	0	18,296	0	31,673	
1997	50,802	0	19,987	0	30,815	
1998	51,005	0	22,015	0	28,990	
1999	51,209	0	23,643	0	27,566	
2000	51,388	0	25,938	0	25,450	
2001	51,440	0	25,977	0	25,463	
2002	51,491	0	26,003	0	25,488	
2003	51,543	0	26,037	0	25,506	
2004	51,594	0	26,055	0	25,539	
2005	51,646	0	26,081	0	25,565	

* ALL WASTE ARE IN TONS

** ALL EXPORTED WASTE ARE TAKEN TO NEWBY ISLAND LANDFILL IN SAN JOSE

AGREEEMENT FOR DISPOSAL OF MUNICIPAL SOLID WASTE

BETWEEN

THE CITY OF CUPERTINO

AND

INTERNATIONAL DISPOSAL CORP. OF CALIFORNIA

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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 Recyclery/Newby Island Landfill

"E" Insurance Requirements

AGREEMENT FOR DISPOSAL OF MUNICIPAL SOLID WASTE

THIS AGREEMENT is made and entered into this _____ day of _____, 1989, by and between the CITY OF CUPERTINO, 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 (including Municipal Solid Waste collected in Debris Boxes), 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, including the portion thereof attributable to Municipal Solid Waste collected in Debris Boxes, is set forth in Exhibit "A", attached hereto and made a part hereof; provided, however, City's Allocation Quantity shall automatically be reduced by the unused portion of the Allocation Quantity attributable to Municipal Solid Waste collected in Debris Boxes at such time as City delivers or causes delivery of Debris Box Municipal Solid Waste to an alternative sanitary landfill pursuant to Section 2.4. (For purposes hereof, the unused portion of the Allocation Quantity attributable to Municipal Solid Waste collected in Debris Boxes shall be the product of (i) the unused portion of the Allocation Quantity multiplied by (ii) a fraction, the numerator of which is the total amount of Municipal Solid Waste which has been collected in Debris Boxes since November 21, 1988, and the denominator of which is the total amount of Municipal Solid Waste (exclusive of Publicly Hauled Waste) which has been delivered to the Disposal Facility since November 21, 1988.) 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 Cupertino, 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 under Section 2.4, Municipal Solid Waste collected pursuant to City's Clean Up Campaign, Publicly Hauled Waste, Maintenance Waste, Municipal Solid Waste collected exclusively for Recycling (with no residual waste) 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.

2.4 Debris Box Municipal Solid Waste

City shall deliver or cause delivery of all Municipal Solid Waste collected in Debris Boxes 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 from and after the date on which City commences to deliver or cause delivery of substantially all such Debris Box Municipal Solid Waste to an alternative sanitary landfill for disposal pursuant to a binding disposal agreement to be in effect thereafter for at least until the expiration of thirty (30) years from and after the date of commencement of performance of this Agreement.

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 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 <u>City Recycle/Transfer Station</u>

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, BAAQMD 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 sixty (60) 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, ssign 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 (a) the remaining portion of City's total Allocation Quantity at the beginning of such calendar year divided by (b) thirty (30) less the number of years (or partial years) elapsed since the date of commencement of performance of this Agreement; 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 Seven Hundred Fifty Thousand and No/100 Dollars ($750,000.00) 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 five 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
10300 Torre Ave.
Cupertino, California 95014

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:

By: _____
Name: _____
Title: City Attorney

ATTEST:

By: _____
Name: _____
Title: City Clerk

CITY OF CUPERTINO, CALIFORNIA,
a municipal corporation

By: _____
Name: _____
Title: Mayor

10300 Torre Ave.
Cupertino, California 95014

"City"

ATTEST:

By: Suzanne F. Good
Name: SUZANNE F. GOOD
Title: NOTARY PUBLIC

OFFICIAL SEAL
SUZANNE F GOOD
NOTARY PUBLIC - CALIFORNIA
SANTA CLARA COUNTY
My comm. expires SEP 3, 1989

INTERNATIONAL DISPOSAL CORP.
OF CALIFORNIA

By: _____
Name: GENE A. MEREDITH
Title: PRESIDENT

55 Almaden Boulevard
San Jose, California 95113
Telephone: (408) 432-1234

"Contractor"

APPROVED AS TO FORM AND LEGALITY:

By: _____
Name: Kathy Kretchmer
Title: Deputy County Counsel

APPROVED:

COUNTY OF SANTA CLARA,
CALIFORNIA

By: _____
Name: Susanne Wilson
Title: Chairperson, pro tempore
BOARD OF SUPERVISORS

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 guarantees 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 Cupertino, California

2,050,000 Tons

APPROVED AS TO FORM AND LEGALITY:

By: _____
Name:
Title: City Attorney

ATTEST:

By: _____
Name:
Title: City Clerk

CITY OF CUPERTINO, CALIFORNIA,
a municipal corporation

By: _____
Name:
Title: Mayor

10300 Torre Ave.
Cupertino, California 95014

"City"

ATTEST:

By: Suzanne F. Good
Name: SUZANNE F. GOOD
Title: NOTARY PUBLIC

OFFICIAL SEAL
SUZANNE F GOOD
NOTARY PUBLIC - CALIFORNIA
SANTA CLARA COUNTY
My comm. expires SEP 3, 1989

INTERNATIONAL DISPOSAL CORP.
OF CALIFORNIA

By: _____
Name: GENE A. MEREDITH
Title: PRESIDENT

55 Almaden Boulevard
San Jose, California 95113
Telephone: (408) 432-1234

"Contractor"

9470-1

EXHIBIT "B"

UNINCORPORATED GEOGRAPHIC AREA OF
SANTA CLARA COUNTY
INCLUDED WITHIN DEFINITION OF CITY

The unincorporated geographic area of Santa Clara County shall include the "Boundary Agreement Area" defined as of the date of this agreement by agreement between the cities of Santa Clara County delineating limits beyond which the cities will not annex. Said boundaries as adopted by the Local Agency Formation Commission are defined on the 500' scale Official City Boundary Maps located in the County Surveyor's Office.

APPROVED AS TO FORM AND LEGALITY:

By: _____
Name:
Title: City Attorney

ATTEST:

By: _____
Name:
Title: City Clerk

CITY OF CUPERTINO, CALIFORNIA,
a municipal corporation

By: _____
Name:
Title: Mayor

10300 Torre Ave.
Cupertino, California 95014

"City"

ATTEST:

By: Suzanne F. Good
Name: SUZANNE F. GOOD
Title: NOTARY PUBLIC

OFFICIAL SEAL
SUZANNE F GOOD
NOTARY PUBLIC - CALIFORNIA
SANTA CLARA COUNTY
My comm. expires SEP 3, 1989

INTERNATIONAL DISPOSAL CORP.
OF CALIFORNIA

By: _____
Name: GENE A. MEREDITH
Title: PRESIDENT

55 Almaden Boulevard
San Jose, California 95113
Telephone: (408) 432-1234

"Contractor"

9470-1

EXHIBIT "C"

EQUIVALENT WEIGHT
OF MUNICIPAL SOLID WASTE

Type of Refuse	Ton Equivalent Per Cubic Yard
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/NEWBY ISLAND LANDFILL ATTRIBUTABLE TO THE CITY OF CUPERTINO, CALIFORNIA

DESIGNATED HAULER _____

MONTH OF _____

DATE	TOTAL NUMBER OF TRUCKS	TOTAL TONS	RATE ($/TON)	TOTAL COST OF LOAD
MONTHLY TOTAL				

TONS RECEIVED AT RECYCLERY	

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 f others assumed by the Subcontractor in th 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 Sate 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 pursuit 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 CUPERTINO, 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.

provide adequate disposal capacity through 2018.

By Resolution No. 7747, the City entered into an agreement with International Disposal Corporation of California, a Subsidiary of Browning-Ferris Industries, Inc., for a long-term disposal of municipal solid waste, through 2018. A copy of this agreement is presented at the end of this section.

Total tonnage allocation for the City of Cupertino is guaranteed 2,050,000 tons.

6.5 NEW OR EXPANDED DISPOSAL FACILITIES

There are no plans to establish a new disposal facility for the City of Cupertino during the planning period.

TABLE 6 - 1

CITY OF CUPERTINO
SOLID WASTE DISPOSAL FACILITY CAPACITY NEEDS

CONTINUATION OF CURRENT PROGRAM						
YEAR	ANNUAL WASTE GENERATED	ANNUAL WASTE IMPORTED	ANNUAL WASTE DIVERTED	ANNUAL WASTE TRANSFORMED	ANNUAL WASTE EXPORTED	REMAINING LANDFILL CAPACITY
1990	51,593	0	8,800	0	42,793	
1991	45,436	0	9,044	0	36,392	
1992	46,663	0	9,274	0	37,389	
1993	47,923	0	9,535	0	38,388	
1994	49,169	0	9,783	0	39,386	
1995	50,398	0	10,016	0	40,382	
1996	50,599	0	10,063	0	40,536	
1997	50,802	0	10,112	0	40,690	
1998	51,005	0	10,161	0	40,844	
1999	51,209	0	10,210	0	40,999	
2000	51,388	0	10,233	0	41,155	
2001	51,440	0	10,240	0	41,200	
2002	51,491	0	10,245	0	41,246	
2003	51,543	0	10,252	0	41,291	
2004	51,594	0	10,257	0	41,337	
2005	51,646	0	10,264	0	41,382	

* ALL WASTE ARE IN TONS

** ALL EXPORTED WASTE ARE TAKEN TO NEWBY ISLAND LANDFILL IN SAN JOSE

TABLE 6 - 2

CITY OF CUPERTINO
SOLID WASTE DISPOSAL FACILITY CAPACITY NEEDS

IMPLEMENTATION OF SRRE						
YEAR	ANNUAL WASTE GENERATED	ANNUAL WASTE IMPORTED	ANNUAL WASTE DIVERTED	ANNUAL WASTE TRANSFORMED	ANNUAL WASTE EXPORTED	REMAINING LANDFILL CAPACITY
1990	51,593	0	8,800	0	42,793	
1991	45,436	0	9,044	0	36,392	
1992	46,663	0	13,658	0	33,005	
1993	47,923	0	14,827	0	33,096	
1994	49,169	0	15,817	0	33,352	
1995	50,398	0	17,290	0	33,108	
1996	50,599	0	18,296	0	31,673	
1997	50,802	0	19,987	0	30,815	
1998	51,005	0	22,015	0	28,990	
1999	51,209	0	23,643	0	27,566	
2000	51,388	0	25,938	0	25,450	
2001	51,440	0	25,977	0	25,463	
2002	51,491	0	26,003	0	25,488	
2003	51,543	0	26,037	0	25,506	
2004	51,594	0	26,055	0	25,539	
2005	51,646	0	26,081	0	25,565	

* ALL WASTE ARE IN TONS

** ALL EXPORTED WASTE ARE TAKEN TO NEWBY ISLAND LANDFILL IN SAN JOSE

AGREEEMENT FOR DISPOSAL OF MUNICIPAL SOLID WASTE

BETWEEN

THE CITY OF CUPERTINO

AND

INTERNATIONAL DISPOSAL CORP. OF CALIFORNIA

7. PUBLIC EDUCATION AND INFORMATION COMPONENT

7.1 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.

7.2 GOALS AND OBJECTIVES

This component documents current education and public information activities for City of Cupertino 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.

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 become easier when the goals and objectives are specified.

Goals identified by City 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, and composting education and public information efforts;
- Increase public awareness of environmental and solid waste issues;
- Create broad visibility for recycling;
- Familiarize consumers with recycling;

- Motivate increased participation in available source reduction and recycling programs by all sectors;
- Stress the importance to all sectors of buying recycled and composted material.

The following sections describe short- and medium-term objectives for City's Education and Public Information Component.

Short-term Objectives

- Expand existing public education and information programs to address source reduction, composting, recycling, and household hazardous waste, tailored to the residential, commercial, industrial, and institutional sectors.
- Create public involvement opportunities through recycling promotions and events.
- Provide residents with detailed information for participation in local collection programs.
- Educate the public about the uses of recycled and composted materials, emphasize "closing the loop" through a "buy recycled" campaign.
- Cultivate support by publicizing and encouraging involvement of the business community.
- Participate in countywide public education efforts.

Medium-term Objectives

Medium-term objectives 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.

7.3 EXISTING CONDITIONS

Residential

The public information office is involved with the gathering and dissemination of news affecting the residents of the City. The two major vehicles for distributing information which have been and continue to be utilized are:

- The Cupertino Scene - a monthly newsletter produced by the City and mailed to every resident and business owner in the city.
- The City channel - Cupertino's municipal government cable TV channel which airs programming on city services and relevant community information.

In addition, the City has held meetings with various community groups to discuss current programs.

The City has participated in creating and staffing an educational display at the 1990 County Fair, promoting recycling in general, as well as curbside programs for individual cities.

- Environmental groups
- Homeowners and neighborhood associations
- Business Associations and Chamber of Commerce
- Senior Citizen organizations
- Multi-family residents
- School District and P.T.A. members

Multi-family

The City initiated a pilot multi-family recycling program in October 1991. As part of that program, a newsletter information sheet was sent to all customers in the pilot program to outline the program.

For the pilot program, the educational approach has focused on encouraging recycling of mixed glass, aluminum cans, plastic soda bottles (PET), and newspaper.

Commercial and Industrial

The City initiated a commercial recycling program in August 1991 to further assist in the ongoing commercial recycling effort by business. Meetings with the large commercial companies in the City has been ongoing since fall of 1990.

For businesses, the educational approach has centered on office paper, cardboard, mixed glass, aluminum, wood pallets, and scrap metal.

In 1990, the City established a committee made up of industrial generators to develop educational materials specifically for industrial users. The purpose is to educate and inform the individual companies and workers about solid waste management and the various community programs available to them. Apple Computer and Hewlett-Packard have established a very intensive commercial recycling program.

A number of businesses and industries have participated in the Santa Clara County Manufacturing Group, which has recently published the "Guide to Commercial Recycling."

Municipal

The City, in cooperation with the Cupertino Union School District has developed educational materials for school age children. These materials have been made available to private schools upon request.

An educational program for city employees was begun in August 1991 to educate the employees about the importance of recycling and to respond to questions from residents.

Developed a mascot which can be easily recognized by children and adults. The mascot custume will be worn by a volunteer and make appearances at community parades, school functions, and special events.

7.4 PROGRAM ALTERNATIVES

To heighten the effectiveness of the various programs, and ensure an efficient use of resources whenever possible, public education and information resources should be targeted to specific audiences. Segmenting the community into various categories of waste

generators provides a simple and useful means of directing specific messages.

The Solid Waste Generation Study for the City of Cupertino indicated that the following are major categories of waste generation in the City: residential, commercial, industrial, institutional.

General Approaches to Education and Public Information

- Create an office of education and public information and/or designate a staff member to be in charge of developing public education and publicity materials. Staffing needs will be sufficient to allow for both work in the office and in the field.

- Create a small community advisory committee to assist in developing and implementing educational programs.

- Develop a comprehensive program that addresses solid waste management in general and AB 939 specifically. The program would be geared to all waste generators.

- Assess the size of the community's non-English speaking or reading populations, in order to tailor education and publicity materials accordingly.

Numerous avenues of communication are available that would allow the transmission of education and public information to the targeted waste generators. Examples are:

- Mass mailings (community newsletters), either alone or with utility bills;

- Placement of door-knob hangers;

- Recognizable theme, logo, and message. The logo should appear on all printed and outdoor advertisements, as well as waste collection vehicles and equipment. Outdoor advertising can be placed on billboards, buses, bus shelters, benches, banners, posters, and litter receptacles;

- Use of a celebrity spokesperson or mascot as part of these efforts;

- Press coverage of as many promotions, program introductions and effectiveness updates, and other notable events as possible;
- Press coverage through news conferences, feature stories, press kits and press releases;
- Newspaper articles and inserts newspapers;
- Local radio and TV to produce awareness shows or public service messages and outdoor advertising;
- Seminars, workshops, and related programs;
- Participation in special events;
- Slide shows, videos, and speakers' bureaus available to community groups;
- Recycling curriculum and other information distributed to public and private schools;
- Cooperation with community service organizations [e.g., Elks, Lions, Boy Scouts].

Education and Public Information Approaches Based on Waste Sector

Residential Sector

Approaches to consider when developing public education programs for the residential sector include:

Meetings and Forums

- Sponsor city 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.

Volunteer Networks

- Expand 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.

Exhibitions

- Exhibit source reduction, recycling, and composting programs at county fairs, shopping centers, parks, community gardens, and other 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.

Commercial and Industrial Sector

The tactics available for reaching the commercial and industrial sectors are generally simpler and more direct. The City can develop materials specific to individual industries or businesses, and disseminate these to the businesses in question via a number of approaches, which may include:

- Mailings to businesses;

- Work with the Chamber of Commerce and other business and professional associations;

- Develop a speakers bureau of educators, industry and technical representatives, and governmental officials to talk to professional organizations, the Chamber of Commerce, major employers, conservation groups, social clubs, and other groups;

- Develop a commercial waste audit kit. Once the audit has been conducted, the City can work with businesses to improve their disposal activities and in doing so will provide direct education and information to these waste generators;

- Work with various unions to encourage members to get involved in union sanctioned functions or workshops;

- Develop specific programs tailored for the need of individual businesses;

- Establish programs for specific business parks and centers;

- Prepare employee kits that explain the various programs. These can be passed out by employers;

- Require refuse hauler(s) to do waste audits and contact customers periodically to offer recycling services.

Institutional Sector

The City will need to work in cooperation with Cupertino School District 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;
- Target non-English speaking youth through bilingual education programs.

The City will need to work in cooperation with De Anza college and retirement homes to develop appropriate programs, such as:

- Conduct waste audits, and upon completion, assist in developing recycling, source reduction, and composting programs;
- Initiate training programs for municipal and county employees to assist in answering questions from residents about existing and anticipated programs as outlined in the SRRE;
- Cooperate with the county and state to develop programs to manage solid waste for agencies located within the community.

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

The emphasis 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 the landfill. To a great extent, source reduction can be accomplished only through legislative means. Requiring manufacturers to reduce the amount of packaging or change the type of packaging 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 tamper-proof packaging which, in some cases, has actually increased the amount of packaging.

A number of educational alternatives are available that will address residential and commercial source reduction. The use of brochures, the media, and public meetings are several avenues that can be used to inform the public. Program possibilities are:

Residential

- 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 onsite 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.

Commercial, Institutional, and Industrial

- Promote source reduction, for example, through trade unions, business and industrial organizations, PTA meetings, and onsite presentations;

- Encourage supermarkets and other large retailers to reduce the use of plastic shopping bags (and other plastic bags) by switching to paper bags and encouraging the use of cloth bags;

- Publicize businesses that reuse and repair materials (e.g., repair stores and thrift stores);

- Develop materials and provide technical assistance to allow "do-it-yourself" waste audits;

- Develop materials and provide technical assistance to encourage the use of onsite composting and grass clipping programs.

Recycling

The emphasis will be to enhance the current recycling education and information programs. The following are recommended approaches:

Residential

- Enhance the residential curbside education program. Part of this approach would include a study to determine whether bilingual materials will be needed;

- Expand information that explains the various enforcement procedures that the City has initiated. Examples include ordinances that prohibit the removal of recyclable materials from curbside by other than a licensed hauler, or destruction of recycling equipment;

- Work with recycling service providers and community groups to publicize the locations and promote the use of buy-back/drop-off collection centers;

- 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 pro-

grams). Provide feedback through ads in local newspapers and publishing of annual reports.

Commercial, Institutional, and Industrial

- In cooperation with the Cupertino Union School District, 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 onsite recycling program. These programs will also be available for use at private schools;
- Expand the commercial and industrial recycling education programs;
- Expand pre-planned educational programs for specific businesses including, dry cleaners, bakeries, service stations;
- Use mailings to businesses giving information about the commercial recycling program;
- Work with the Chamber of Commerce, unions, and other business groups to inform the business community;
- Develop a list of brokers who deal with recyclables and mail to businesses and industries.

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

- Develop educational materials that address the residential yard waste collection program for leaves, grass clippings, and other vegetative material, with corresponding information on handling;
- Inform the public 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 reports in local newspapers);

- Educate the public on the benefits of using compost and mulch for home purposes.

Commercial, Institutional, and Industrial

- Develelop information and education materials to support commercial, institutional, and industrial yard waste collection programs.

Special Wastes

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. Examples of programs to consider are:

Residential

- Expand 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;

- Expand 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;

Commercial, Institutional, and Industrial

- Expand 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 industries, institutions, and businesses;

- Expand 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 detailed discussion on education and information.

7.5 PROGRAM SELECTION

Short-term

General Approaches

- Expand program that addresses solid waste management in general. Approach should be directed to residential, commercial, and industrial generators;
- Provide feedback to the public on the success of all implemented programs. Methods include publishing an annual report and newspaper articles;
- In cooperation with local schools, 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;
- Expand information for commercial and self-haul generators to explain various options for the disposal of construction and demolition debris;
- Encourage working cooperatively with other jurisdictions in the development of countywide public education materials.

Source Reduction

- Develop a backyard composting program. Include establishment of demonstration plots, availability of composting kits, "how-to" literature, materials describing the uses for compost, and establishment of a Master Composter program;

- Develop materials that explain the grass clipping program;
- Publish a directory of all reuse and repair businesses.

Recycling

- Enhance education materials for residential curbside recycling program;
- Enhance materials for commercial and industrial recycling programs. Include "Recycling Kit," cooperative efforts with Chamber of Commerce, and establishment of a committee made up of business leaders;
- Publish a directory that lists brokers and end users of recyclable materials;
- Expand information that explains various enforcement measures that have been taken to protect recycling equipment and the illegal removal of recyclable materials from curbside collection programs;
- Develop education materials for residential curbside collection of yard waste. Include information about how residents can obtain compost from the program;
- Develop materials to support a commercial yard waste collection program.

Special Waste

- Develop education materials that describe how to properly dispose of special wastes.

Household Hazardous Waste

- Expand 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 educational materials to explain the county-wide household hazardous waste program, its functions, and how to use the various services;
- Develop a program for small quantity generators of household hazardous waste.

Cost

The development of the public information plan and its implementation and monitoring would require additional staff time. Whenever possible, volunteers will be encouraged to assist in the education and public information outreach programs, with City guidance. Funding will be provided by the City'Resource Recovery Fund. Estimated cost is $50,000 per year.

7.6 IMPLEMENTATION

Each component requires the implementation of certain educational 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 refocus attention to any diversion short-fall.

7.7 MONITORING OF PROGRAMS

The public information officer will be responsible for monitoring the success of the programs.

The monitoring necessary to evaluate the various programs can be accomplished by means of one or more of the following approaches:

- Number of schools and students exposed to various programs;
- Number of businesses taking part in programs;
- Number and size of community events and activities;
- Number and frequency of media advertising purchased;
- Surveys conducted to determine awareness and participation levels for the various components;
- Complaints and requests for information received by the office of education and information and/or the contractors providing the various services;
- 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.

Evaluation of Program Effectiveness

The public information officer will be responsible for evaluating the success of the programs. An annual report, outlining the success of individual tasks, comparisons with neighboring communities, and plans for next year, will be the responsibility of this office.

Evaluation can occur at various stages of the public education and public information process depending on the objective to be

measured. The criteria used to evaluate the effectiveness of the education and public information efforts will be determined in advance and will be appropriate to the monitoring methods that have been chosen.

Formative evaluation attempts to identify the strengths and weaknesses of the messages, materials, and educational or informational strategies before one 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 the 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 include:

- Increase the frequency, type, or extent of program monitoring and review to discover the reasons why diversion rates are not achieved;
- Revise education and public information efforts to make them more effective based on results of evaluation;
- Expand the education and public information programs by adding new components or increasing frequency;
- Publicize 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.

8. FUNDING COMPONENT

8.1 INTRODUCTION

This component describes the funding mechanisms in the City of Cupertino, estimated costs for the component programs for implementation, revenue sources to support future programs and contingency funding sources.

The purpose of the funding component is to demonstrate that the City of Cupertino has sufficient funding and allocation of resources to implement the selected SRRE programs identified in this document.

8.2 CURRENT FUNDING SOURCE

The City of Cupertino's source of funding for integrated waste management activities is the Resource Recovery Fund. All revenues within this fund can only be used for the purpose of expenditures related to solid waste related programs, including disposal, curbside recycling, household hazardous waste events, spring and fall clean-ups, public education, and administration.

Revenue for the resource recovery fund comes from rates from refuse collection by Los Altos Garbage Co., the refuse collector for the City of Cupertino. The City has entered into a new collection agreement with Los Altos Garbage Co. effective February 21, 1989 for a period of ten (10) years.

The current residential rate is $8.95 per household per month for one can; $11.00, two cans; $14.50, three cans; $10.00, extra can. Of this amount, Los Altos Garbage Co. pays the City ten percent (10%) franchise fee which goes to the City General Fund and pays the City 34 percent which goes to the City Resource Recovery Fund.

The residential inverted rates became effective July 29, 1991. These rates also pay for the City's residential curbside recycling program.

The rate structure (inverted) is further explained in Section 3, SOURCE REDUCTION COMPONENT.

Solid waste related revenue sources provide sufficient revenue to fund all integrated waste management programs. These sources and their revenue contributions to the Resource Recovery Fund for 1990-91 and 1991-92 are as follows:

Source	1990-91	1991-92
Customer Charges	$ 1,485,000	$ 1,500,000
Curbside Recycle Credit	104,757	104,757
AB939 Fees	0	0
Total Resource Fund	$ 1,589,757	$ 1,604,757

Customer Charges

Customers, both residential and commercial, are charged for garbage collection based on quantity collected and collection frequency. The hauler (Los Altos Garbage Co.) does the billing and pays the City ten percent (10%) for the City's General Fund, and thirty-four percent (34%) that goes to Resource Recovery Fund.

Curbside Recycling Credit

A curbside recycling credit is paid to the City by Newby Island Landfill operator, IDC/BFI. The current credit in fiscal year 1991-92 is $0.90 per single-family household. This generated $104,757.

AB939 Fees

The City is allowed to charge fees for implementation of AB 939 programs. In fiscal year 1992-93, a countywide fee has been implemented which would provide new revenue for AB 939 programs. This may generate about $38,000.

8.3 ESTIMATED PROGRAM COSTS

Annual program cost estimates through 1995 are presented in Table 8-1.

8.4 REVENUE SOURCES FOR FUTURE PROGRAMS

The source of funding future programs during the short-term period in the City of Cupertino will be the City's Resource Recovery Fund.

Increase in garbage rates for all garbage service in the City will be made to generate additional revenue to offset new program costs.

The City will continue to expand the recycling in the commercial sector, thus reducing disposal cost to the City.

A countywide AB939 tonnage fee is under investigation to assist in funding the City's public information programs.

8.5 CONTINGENCY FUNDING SOURCE

Contingency funding source for the City might be obtained from:

- Special taxes or assessments
- Rate structure modifications

TABLE 8 - 1

ANNUAL PROGRAM COST

PROGRAMS	ANNUAL PROGRAM COSTS				
	1991	1992	1993	1994	1995
SOURCE REDUCTION	$500	$500	$500	$500	$500
RECYCLING	$267,000	$267,000	$267,000	$267,000	$267,000
COMPOSTING	$0	$100,000	$600,000	$600,000	$600,000
PUBLIC EDUCATION	$50,000	$50,000	$50,000	$50,000	$50,000
SPECIAL WASTE	$500	$500	$500	$500	$500
HOUSEHOLD HAZARDOUS WASTE	$50,000	$50,000	$50,000	$50,000	$50,000
TOTAL	$368,000	$468,000	$968,000	$968,000	$968,000

9. SPECIAL WASTE COMPONENT

9.1 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."

9.2 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 wastewater treatment plants during secondary treatment of waste water. In areas where wastewater 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[1] unless the Department of Health Services 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, the 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 nonfriable (nonhazardous). 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, nonfriable 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.

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1 A Class III landfill accepts only nonhazardous solid waste.

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 nonprutrescible waste and therefore can be accepted at Class III or unclassified landfills.

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 should 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.

9.3 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 (nonhazardous) 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

Tires accepted for disposal should be placed flat at the base of the active face in order to inhibit the tendency of tires in landfills to float to the surface. To prevent differential settlement, tires should not be buried in high concentrations in one area of the landfill. Tires can also be shredded before being landfilled in order to make burial less problematic.

White Goods

White goods 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 should be removed from the units before placement of the white goods in the landfill. These components are removed to prevent the potential release of PCBs and CFCs when the wastes are crushed.

The Salvation Army in San Jose processes about 100 refrigerators/ freezers per week. They sell the repaired units at their 16 thrift stores. They also remove the cooling units of those appliances that are not usable and recycle the metals through various metal recylers.

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.

9.4 OBJECTIVES

The special waste objectives presented in this section have been developed to meet the goal of reducing the amount of solid waste generated in the City of Cupertino. 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 City can expect to divert a variable percentage of the total waste stream by implementing the following objectives:

- continue existing programs that divert recyclable special waste from landfilling.
- continue to provide for environmentally safe management or disposal of special waste that cannot be recycled.
- 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.

9.5 EXISTING CONDITIONS DESCRIPTION

Program Description and Wastes Diverted. This section describes existing special waste diversion and management activities and programs in the City. The City has carefully reviewed and documented all potential and ongoing special waste efforts, including all the City programs.

Sewage Sludge. The San Jose/Santa Clara Wastewater Plant treats wastewater from Cupertino, San Jose, Santa Clara, Milpitas, Monte Sereno, Campbell, Los Gatos, and Saratoga, and from surrounding unincorporated areas. The plant performs primary, secondary, and tertiary treatment of water. Sludge is spread over 640 acres of lagoons, producing around 110 dry-tons of sludge per day. Dried Sludge is stockpiled and tested for agriculture, physical, and chemical parameters.

The San Jose/Santa Clara Plant is regulated by the State of

California Water Resources Control Board which governs all waste to land under Subchapter 15. The local San Francisco Bay Regional Water Quality Control Board regulates the San Jose/Santa Clara Plant through the National Pollution Discharge Elimination System Permit (NPDES). The current Permit requires a Characterization Study of the two sludge lagoons and a Waste Minimization and Source Control Study of influent into the sanitary sewer. The Bay Area Air Quality Management District (BAAWMD) regulates the Plant as an Air Pollutant Emitting Source.

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 San Jose area, two landfills will accept non-friable asbestos-containing wastes for disposal: the Guadalupe Landfill and the Zanker Road Landfill.

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 tires to produce steam to generate electricity. The plant recovers incineration by-products inclduing 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).

White Goods. Individuals wishing to dispose of white goods can call a refuse hauler, charities (such as the Salvation Army and Goodwill Industries) or junk collectors; haul the items to the landfill; or use the materials as a trade-in for new items. At some landfills, controlled salvaging is authorized by the site operator if salvaging does not interfere with proper operation of the landfill. Salvaging results in reuse of variable materials and decreases wastes requiring landfill disposal.

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.

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.

Dead Animals. The primary management practice for small dead animals in the City 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. Rendering firms serving local needs include one in San Jose and firms located in Salinas and Sacramento.

Other Special Waste. This category has been used for a group of wastes which are potential special waste. These wastes are mattresses, furniture, and street sweeping and storm drain spoils. Mattresses and box springs and large furniture are disposed of at Zanker Landfill and Newby Island Landfill. Street sweepings, storm drain spoils and litter in Cupertino amount to an estimated 1,000

tons per year. They are disposed at Newby Island Landfill.

9.6 EVALUATION OF ALTERNATIVES

Management practices should take advantage of all viable markets and end uses for recyclable special wastes. In the City, the recyclable special wastes include abandoned vehicles, ash, dead animals, tires, and white goods. 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 City can be disposed of at the all purpose, Newby Island Landfill in accordance with the facility's Waste Discharge Requirements (WDR), issued by the Regional Water Quality Control Board. Based on Newby Island Landfill's WDR's, all of the following special wastes described above, with the exception of abandoned vehicles, can be landfilled at the facility. 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 City, 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 "startup" 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.

Institutional Barriers. There are no significant institutional barriers to this alternative.

Estimated Cost. No significant costs are associated with this alternative.

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 City 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 can be accomplished in the short-term.

Facility Requirements. No additional facilities are needed.

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.

End Uses. Composted sewage sludge can be sold to the general public as a soil condition, 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 City 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 waste stream since sludge *is not* currently disposed of at the landfill.

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. Depending on the exact quantities of sludge diverted, current sludge handling costs are estimated to increase from about 5 to 20 percent.

End Uses. When applied to land, sewage sludge functions as 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 City 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 City would develop a contractual arrangement with a firm such as Oxford Tire Recycling of Northern California to collect used tires generated by the City. 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. This alternative would have a positive effect on the waste stream by diverting a problem waste from landfilling. Tires represent approximately 1.7 percent of the disposal waste stream in the City.

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 Sec-

tion 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. Diversion of tires for ultimate end use is consistent with plans and policies and ordinances of the City.

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 retreaded 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 continue to be accepted at the landfill, but would be banned from disposal. The landfill 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. 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; tires represent approximately 1.7 percent of the waste in the City.

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 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. Stockpiling of tires can take place with current landfill staffing.

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 landfill, but would be banned from disposal. The landfill 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. According to Section 608 of the 1990 Clean Air Act Amendment, after July 1, 1992 the release of CFC's in the environment, as well as the disposal of "white goods" containing CFC's is prohibited.

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.

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. In 1990, white goods represented approximately 0.6 percent of the waste in the City.

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 foundaries to produce new steel.

Alternative 7 - White Goods Processing Operation

White goods can be diverted from the waste stream at the transfer station and/or the landfill 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.

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.

Implementation Period. Immediate implementation appears feasible using equipment and personnel that are currently available at the landfill.

Facility Requirements. This alternative requires an area at the landfill 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.

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 foundaries to produce new steel. The market for scrap metal is relatively stable.

9.7 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 City. In addition, each alternative has aspects that may be more or less appropriate to the City's goals, objectives, policy environment, waste stream, and solid waste management system.

In this section, the City presents the results of the evaluation of the alternatives presented in the previous section. To accomplish this, the City has assessed whether or not each alternative is appropriate to the City's needs and assigned each alternative a ranking in order to select various alternatives. In selecting among alternatives and programs, the City 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, and solid waste management system), 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.

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 is presented below.

Short-Term Planning Period

In order to meet the goals and objectives outlined in this component, the City has selected the following alternatives:

- Continue to review disposal of special waste.
- Review a program to divert tires from landfilling for ultimate end use.
- Continue a program to prohibit disposal of used tires at landfills.
- Continue a program to prohibit disposal of white goods at landfills. AB 1760 prohibits after January 1, 1994 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.

- Encourage cooperative efforts with landfill operator and other jurisdictions for prohibiting disposal, safe handling and storage, and marketing the diverted material.

9.8 PROGRAM IMPLEMENTATION

The City Public Works Department will be responsible for coordinating the special waste program.

The City of Cupertino will work with BFI to have this program implemented at the landfill site.

Public information material will be developed to inform residence of alternative ways to dispose of special waste.

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.

9.9 MONITORING AND EVALUATION

To ensure that the selected special waste alternatives and programs are meeting the goals and objectives of this component, the City 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 City'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 of potential of abandoned vehicles, dead animals, tires, and white goods.

Objective 2: Continue existing 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.

Monitoring Method: Periodic inspections of handling methods for special waste will be conducted at the landfill. 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 conducted 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 the increased diversion of special waste from landfilling. Specific emphasis will be given to quantifying the reduction in landfilling of special waste that poses health and safety hazards.

Written Criteria. The City 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 Department of Public Works.

Funding Requirements. Funding for the monitoring and evaluation program described in this section will be provided by the City through the City Resource Recovery Fund. Funding for this program includes the costs of (1) administrative activities, (2) recordkeeping, (3) program monitoring and surveying, (4) tracking of survey results, and (5) annual report-writing.

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.

10. INTEGRATION

10.1 OVERVIEW

The California Waste Management Act (AB 939) mandates that a jurisdiction achieve a twenty five percent (25%) waste diversion rate by January 1, 1995, and a fifty percent (50%) waste diversion rate by January 1, 2000. This chapter describes how the City of Cupertino will integrate solid waste management practices to achieve the diversion requirements specified in AB 939, the California Integrated Waste Management Act. First, priorities among component alternatives must be determined which conform to the integrated waste management hierarchy of--(1) Source Reduction, (2) Recycling and Composting, and (3) Environmentally-safe Transformation and Disposal.

10.2 COMPLIANCE WITH DIVERSION MANDATES

The City of Cupertino currently diverts approximately 19.9% percent of the solid waste generated through existing diversion programs.

The City of Cupertino disposed waste by source:

Residential	31%
Commercial	34%
Industrial	34%
Self-Haul	1%
	100%

The City will place emphasis on commercial recycling, since commercial solid waste (including the commercial, industrial and self-haul sectors) constitutes sixty nine percent (69%) of the solid waste generated in the City.

A summary of implementation, timelines by program component is presented in Table 10-1.

10.3 SELECTED PROGRAMS TO MEET DIVERSION GOALS

This report focuses on activities and programs which are to be continued, expanded, or implemented in the City of Cupertino, and one designed to comply with the integrated waste management hierarchy established by AB 939. These programs were chosen because they are expected to provide the largest waste diversion for the least cost in the short-term.

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 preventive measure.

Rate Structure. The City has adopted an inverted rate structure in Table 10-1

Table 10 - 1
1991 - 1995 IMPLEMENTATION SCHEDULE

TYPE OF DIVERSION	IMPLEMENTATION TASKS	RESPONSIBLE AGENCY	IMPLEMENTATION DATE	FUNDING SOURCE
SOURCE REDUCTION				
	Continue an inverted rate structure.	City	ongoing	user fee
	Establish public information materials to heighten awareness of source reduction measures the entire community can adopt to reduce waste.	City/LAGCO	ongoing	user fee
	Expand source reduction program in all City offices and operations.	City	ongoing	N/A
RECYCLING (Residential)	Increase participation.	City/LAGCO	ongoing	user fee
	Expand curbside recycling collection program.	City/LAGCO	October 1992	user fee
	Expand recycling collection services to all multi-family households.	City/LAGCO	October 1992	user fee
	Increase education and public information program. (phone book, cardboard, xmas trees, etc.)	City/LAGCO	ongoing	user fee
RECYCLING (Commercial)	Increase participation.	City/LAGCO	ongoing	user fee
	Expand commercial recycle program.	City/LAGCO	ongoing	user fee
	Increase education and public information program.	City/LAGCO	ongoing	user fee
	Assist in the development of a recycle center.	City/LAGCO	ongoing	N/A
COMPOSTING				
	Establish residential yard waste collection program.	City/LAGCO	October 1992	user fee
	Establish or encourage commercial yard waste collection program.	City/LAGCO	June 1994	user fee
	Increase education and public information material.	City/LAGCO	ongoing	user fee

Table 10 - 1 (cont)
1991 - 1995 IMPLEMENTATION SCHEDULE

TYPE OF DIVERSION	IMPLEMENTATION TASKS	RESPONSIBLE AGENCY	IMPLEMENTATIO DATE	FUNDING SOURCE
PUBLIC INFORMATION (General)	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.	City	November 1992	user fee
	Expand information for self-haul generators to explain various options for the disposal of construction and demolition debris.	City/LAGCO	June 1993	user fee
	Enhance education materials for residential curbside recycling program.	City/LAGCO	ongoing	user fee
PUBLIC INFORMATION (Recycling)	Enhance education materials for residential curbside recycling program.	City/LAGCO	ongoing	user fee
	Enhance education materials for residential curbside collection of yard waste.	City/LAGCO	ongoing	user fee
	Enhance materials for commercial and industrial recycling programs.	City/LAGCO	June 1993	user fee
	Publish a directory that list brokers and end users of recyclable materials.	City/LAGCO	June 1993	user fee
PUBLIC INFORMATION (Special Waste)	Develop education materials that describe how to properly dispose of special waste. (white goods, tires, batteries, construction and demolition debris, etc.)	City/LAGCO	September 1992	user fee
PUBLIC INFORMATION (Household Hazardous Waste)	Expand materials to support the household hazardous waste program. (paint, oil, pesticides, corrosives, oxidizers, flammables, etc.)	City	ongoing	user fee

July 1991. Inverted rates will consist of a per can rate resulting in higher costs to customers as more cans are used.

Public Information. The City will continue to provide public education efforts through the City newsletter, the school system and through the local government channel to increase awareness of source reduction and waste management issues

City Programs. The City will continue with the established policies and procurement programs to encourage source reduction through purchasing decisions. Other City programs that will continue or be implemented are:

- Use of double-sided copiers in office and print shops
- Use of mug program
- Use of scratch pads from blank sides of scrap paper

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.

Residential. Residential recycling will be expanded from the existing program to include recycling collection services to all residential households, including single and multi-family dwellings. Curbside collection services will be expanded to include additional items as markets become available. A cardboard drop-off program has been implemented in September of 1991. Education and public information programs will also be expanded to increase residential recycling participation.

In the short-term, the residential recycling program is expected to divert approximately 11% percent of the solid waste generated in the City; in the medium-term, that figure is expected to increase to approximately 12% percent.

Commercial. Commercial recycling will demand a high priority since commercial solid waste constitutes sixty nine percent (69%) of the solid waste generated in the City. The City has been meeting with members of the larger companies in the City to plan and discuss the issues behind AB 939.

The larger companies (Hewlett Packard, Apple Computers, Tandem Computers, Measurex, Digital, Motorola, and Vallco Shopping Center) have implemented an excellent source reduction and recycling programs. The meetings with the larger companies have been a very good platform for information exchange. The City will require

further detailed recycling information to assist in the City's goal of solid waste from the business diversion.

Education and public information programs will also be expanded to help increase commercial recycling participation from all the commercial and industrial sectors.

The development of a recycle center will also be high on the priority list for commercial recycling. The recycle center in the City has been closed at DeAnza College in 1991, and a new site is being sought. The recycle center served as a source for small business and multi-family units to recycle their items.

In the short-term, the commercial recycling program is expected to divert approximately 18% percent of the solid waste generated in the City.

Composting

The City of Cupertino is currently in the process of implementing residential yard waste collection and composting programs. Like recycling, composting will play an important role in the City's integrated solid waste management system. The waste is expected to be transported to Zanker Road Resource Recovery for composting and recycling. This program will process 2,700 tons of yard waste per year into compost.

Education and public information programs will be developed to encourage the use of this program.

In the short-term, the composting program is expected to divert approximately 5% percent of the solid waste generated in the City.

Special Waste

The City of Cupertino's objective for handling special waste generated in the City and to continue existing programs that divert recyclable special waste from landfilling, continue to provide environmentally safe management or disposal of special waste that cannot be recycled and increase the recovery of recyclable special waste from the solid waste stream.

10.4 COMPONENT INTEGRATION

Table 10-2 lists the tonnage that will be diverted by material type and program. Table 10-3 shows total waste diversion for short-term and medium-term goals.

The integrated schedule for the short-term planning period, shown in Table 10-1, includes all implementation tasks described above for new and expanded programs, and identifies the agency responsible for implementation. Programs to meet waste diversion goals scheduled for the medium-term would expand from those programs initially implemented in the short-term planning period.

As shown in Table 10-2, the City is expected to exceed the 25 percent short-term goal, if all programs are implemented on schedule. Likewise, the medium-term goal of 50 percent will also be met assuming this plan's programs are implemented as described and estimated recycling percentages are achieved.

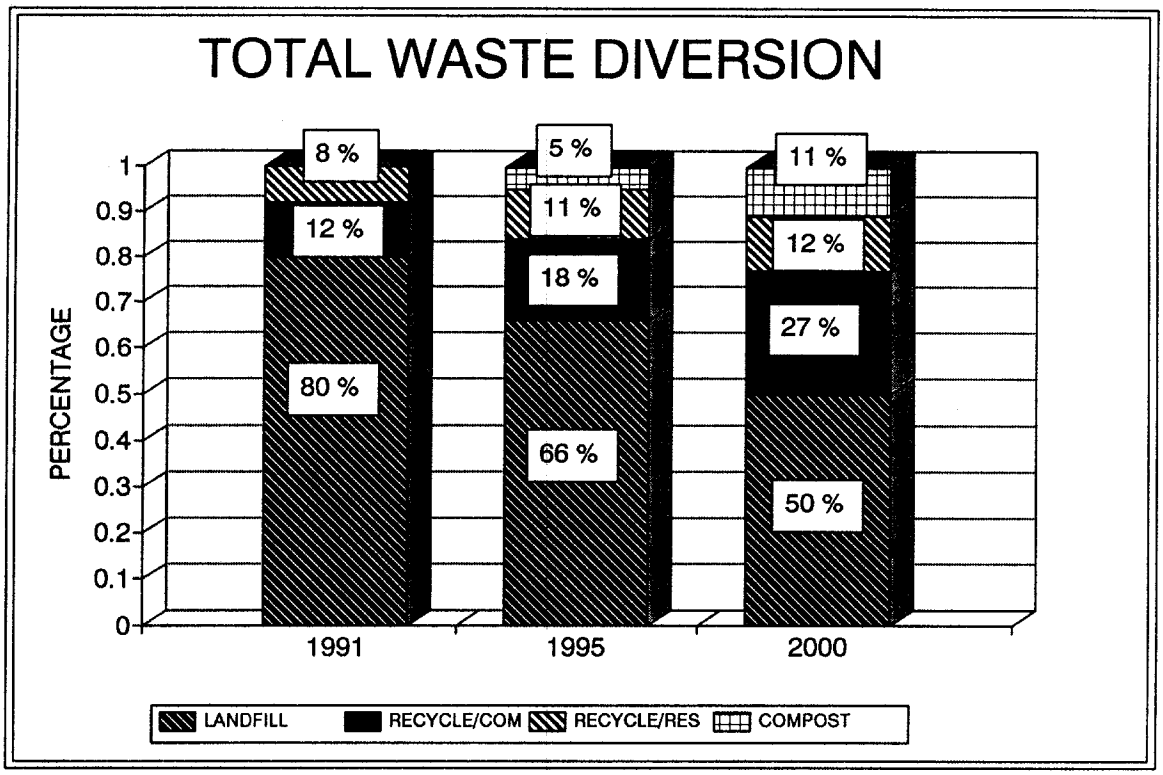
TABLE 10-2

TOTAL WASTE DIVERSION PROJECTIONS

WASTE DIVERTED, TONS

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
SOURCE REDUCTION																
Existing Programs																
RECYCLING																
Existing Residential Recycl	3,381	3,582	3,667	3,766	3,861	3,949	3,967	3,986	4,004	4,023	4,023	4,034	4,036	4,039	4,041	4,043
Existing Commercial Recycl	5,419	5,462	5,607	5,769	5,922	6,067	6,096	6,126	6,157	6,187	6,201	6,206	6,209	6,213	6,216	6,221
Expand/Improve Curbside			600	650	800	1,404	1,410	1,698	1,705	1,712	2,005	2,179	2,181	2,298	2,300	2,300
Expand Multi-Family Recycling			1,134	1,553	1,992	2,450	2,870	2,881	4,133	4,979	5,832	5,837	5,844	5,849	5,855	5,855
Expand Industrial			100	414	567	726	875	1,171	1,470	1,771	2,074	1,937	2,036	2,020	2,019	2,038
COMPOSTING																
Expand Yard Waste Recycling			2,500	2,600	2,600	2,619	2,630	2,640	2,651	2,662	2,864	2,852	2,762	2,680	2,683	2,683
Yard Waste Self-hauler Drop-off																
Commer. Compost							1,003	1,410	1,820	2,234	2,855	2,857	2,860	2,863	2,866	2,866
Wood Chip			50	75	75	75	75	75	75	75	75	75	75	75	75	75
SPECIAL WASTE																
Existing Programs																
Divert Tires																
White Goods Processing																
TOTAL WASTE DIVERTED		9,044	13,658	14,827	15,817	17,290	18,926	19,987	22,015	23,643	25,929	25,977	26,003	26,037	26,055	26,081
WASTES GENERATED	51,593	45,436	46,663	47,923	49,169	50,398	50,599	50,802	51,005	51,209	51,388	51,440	51,491	51,543	51,594	51,646
DIVERSION RATE		19.9%	29.3%	30.9%	32.2%	34.3%	37.4%	39.3%	43.2%	46.2%	50.5%	50.5%	50.5%	50.5%	50.5%	50.5%
NEW TRANSFORMATIONS (MRFs)																
WASTES LANDFILLED	42,793	36,392	33,005	33,096	33,352	33,108	31,673	30,815	28,990	27,566	25,459	25,463	25,488	25,506	25,539	25,565
LANDFILL REDUCTION																

Table 10-3


TOTAL WASTE DIVERSION
PERCENTAGE
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
8 %
12 %
80 %
5 %
11 %
18 %
66 %
11 %
12 %
27 %
50 %
1991
1995
2000
LANDFILL
RECYCLE/COM
RECYCLE/RES
COMPOST

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 [(recycling + source reduction)/total generated = diversion rate percent]

APPENDIX B

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,

Margaret J. Rands, Solid Waste Program Manager

Enclosures

Board of Supervisors: Michael M. Honda, Zoe Lofgren, Ron Gonzales, Rod Diridon, Dianne McKenna
County Executive: Sally R. Reed

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
_____Broker
_____End market/Manufacturer
_____Scrap Metal Dealer
_____Auto Wrecker
_____Asphalt/Concrete Recycler
_____Demolition Debris Recycler
_____Wood Waste Chipper
_____Confidential Paper Service
_____Other Commercial Recycler (Specify)_____
_____Special Waste Recycler (See listing below; specify)_____

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.

Printed on Recycled Paper

Recycling M ial Report Form

CITY_____

Please indicate SOURCE of the material (give % if more than one source) Residents, Commercial Businesses, Industry, or Other.

Materials Collected	Total Tons Received (by City)	Source	Purchaser (if not end user)
PAPER			
Corrugated cardboard			
Mixed paper			
Newspaper			
High grade ledger			
Other paper (specify)			
PLASTICS			
HDPE containers			
PET containers			
Film plastics			
Laser toner cartridges			
Other plastics			
GLASS			
Refillable glass beverage containers			
CA Redemption Value glass			
Other recyclable glass			
METALS			
Aluminum cans			
Bi-metal containers			
Ferrous metals and tin cans			
Non-ferrous metals plus al scrap			
White goods (appliances, etc.)			
YARD WASTE			
including leaves, grass and prunings			
OTHER ORGANICS			
Food waste			
Tires and rubber products			
Wood waste, incl. pallets			
Agricultural crop residues			
Manure			
Textiles and leather			
INERT SOLIDS			
Rock, concrete, brick			
Sand, soil, or dirt			
SPECIAL WASTES			
Ash			
Industrial sludge			
Auto shredder waste			
Batteries			
Oil			
Other (specify)			

APPENDIX C

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. R DENTIAL DIVERSION PROGRAMS
(Tons/Year)

	Curbside	20/20	Apartment Recycler	Other Recycling Drop-off Programs	Composting	Source Reduction Programs	Total
PAPER							
corrugated containers							
newspaper	1000		20	200			1220
high grade ledger paper							
mixed paper							
other paper							
PLASTICS							
HDPE containers							
PET containers		2					2
film plastics							
other plastics							
GLASS							
refillable bev. containers							
CA Redemption Value	300	50	10	100			460
other recyclable glass	300						300
other non-recyclable glass							
METALS							
aluminum cans	50	10	2				62
bi-metal containers							
tin cans	40						40
other ferrous	100						100
other aluminum							
other non-ferrous							
white goods							
YARD WASTE							
leaves, grass					800		800
brush, branches					300		300
OTHER ORGANICS							
food waste						50	50
tires/rubber							
wood wastes							
agricultural crop residues							
manure							
textiles/leather							
diapers							
other misc. organics							
OTHER WASTES							
inert solids							
hazardous waste							
SPECIAL WASTES							
ash							
sewage sludge							
industrial sludge							
asbestos							
auto shredder waste							
auto bodies							
other special waste							
TOTAL	1790	62	32	300	1100	50	3334

Sample Form 2. RESIDENTIAL DIVERSION PROGRAMS
urchaser)

	Curbside					
PAPER						
corrugated containers						
newspaper						
high grade ledger paper						
mixed paper						
other paper						
PLASTICS						
HDPE containers						
PET containers						
film plastics						
other plastics						
GLASS						
refillable bev. containers						
CA Redemption Value						
other recyclable glass						
other non-recyclable glass						
METALS						
aluminum cans	ABC aluminum					
bi-metal containers						
tin cans						
other ferrous						
other aluminum						
other non-ferrous						
white goods						
YARD WASTE						
leaves, grass						
brush, branches						
OTHER ORGANICS						
food waste						
tires/rubber						
wood wastes						
agricultural crop residues						
manure						
textiles/leather						
diapers						
other misc. organics						
OTHER WASTES						
inert solids						
hazardous waste						
SPECIAL WASTES						
ash						
sewage sludge						
industrial sludge						
asbestos						
auto shredder waste						
auto bodies						
other special waste						

Table 1. RESIDENTIAL DIVERSION PROGRAMS
(Tons/Year)

							Total
PAPER							
corrugated containers							
newspaper							
high grade ledger paper							
mixed paper							
other paper							
PLASTICS							
HDPE containers							
PET containers							
film plastics							
other plastics							
GLASS							
refillable bev. containers							
CA Redemption Value							
other recyclable glass							
other non-recyclable glass							
METALS							
aluminum cans							
bi-metal containers							
tin cans							
other ferrous							
other aluminum							
other non-ferrous							
white goods							
YARD WASTE							
leaves, grass							
brush, branches							
OTHER ORGANICS							
food waste							
tires/rubber							
wood wastes							
agricultural crop residues							
manure							
textiles/leather							
diapers							
other misc. organics							
OTHER WASTES							
inert solids							
hazardous waste							
SPECIAL WASTES							
ash							
sewage sludge							
industrial sludge							
asbestos							
auto shredder waste							
auto bodies							
other special waste							
TOTAL							

Table 2. RESIDENTIAL ERSION PROGRAMS
(Purc. er)

PAPER						
corrugated containers						
newspaper						
high grade ledger paper						
mixed paper						
other paper						
PLASTICS						
HDPE containers						
PET containers						
film plastics						
other plastics						
GLASS						
refillable bev. containers						
CA Redemption Value						
other recyclable glass						
other non-recyclable glass						
METALS						
aluminum cans						
bi-metal containers						
tin cans						
other ferrous						
other aluminum						
other non-ferrous						
white goods						
YARD WASTE						
leaves, grass						
brush, branches						
OTHER ORGANICS						
food waste						
tires/rubber						
wood wastes						
agricultural crop residues						
manure						
textiles/leather						
diapers						
other misc. organics						
OTHER WASTES						
inert solids						
hazardous waste						
SPECIAL WASTES						
ash						
sewage sludge						
industrial sludge						
asbestos						
auto shredder waste						
auto bodies						
other special waste						

Table 3. COMMERCIA VERSION PROGRAMS
(Tons/Year)

							Total
PAPER							
corrugated containers							
newspaper							
high grade ledger paper							
mixed paper							
other paper							
PLASTICS							
HDPE containers							
PET containers							
film plastics							
other plastics							
GLASS							
refillable bev. containers							
CA Redemption Value							
other recyclable glass							
other non-recyclable glass							
METALS							
aluminum cans							
bi-metal containers							
tin cans							
other ferrous							
other aluminum							
other non-ferrous							
white goods							
YARD WASTE							
leaves, grass							
brush, branches							
OTHER ORGANICS							
food waste							
tires/rubber							
wood wastes							
agricultural crop residues							
manure							
textiles/leather							
diapers							
other misc. organics							
OTHER WASTES							
inert solids							
hazardous waste							
SPECIAL WASTES							
ash							
sewage sludge							
industrial sludge							
asbestos							
auto shredder waste							
auto bodies							
other special waste							
TOTAL							

Table 4. COMMERCIAL DI `SION PROGRAMS
(Purcha..r)

PAPER						
corrugated containers						
newspaper						
high grade ledger paper						
mixed paper						
other paper						
PLASTICS						
HDPE containers						
PET containers						
film plastics						
other plastics						
GLASS						
refillable bev. containers						
CA Redemption Value						
other recyclable glass						
other non-recyclable glass						
METALS						
aluminum cans						
bi-metal containers						
tin cans						
other ferrous						
other aluminum						
other non-ferrous						
white goods						
YARD WASTE						
leaves, grass						
brush, branches						
OTHER ORGANICS						
food waste						
tires/rubber						
wood wastes						
agricultural crop residues						
manure						
textiles/leather						
diapers						
other misc. organics						
OTHER WASTES						
inert solids						
hazardous waste						
SPECIAL WASTES						
ash						
sewage sludge						
industrial sludge						
asbestos						
auto shredder waste						
auto bodies						
other special waste						

Table 5. INDUSTRIAL /ERSION PROGRAMS
(Tons/Year)

							Total
PAPER							
corrugated containers							
newspaper							
high grade ledger paper							
mixed paper							
other paper							
PLASTICS							
HDPE containers							
PET containers							
film plastics							
other plastics							
GLASS							
refillable bev. containers							
CA Redemption Value							
other recyclable glass							
other non-recyclable glass							
METALS							
aluminum cans							
bi-metal containers							
tin cans							
other ferrous							
other aluminum							
other non-ferrous							
white goods							
YARD WASTE							
leaves, grass							
brush, branches							
OTHER ORGANICS							
food waste							
tires/rubber							
wood wastes							
agricultural crop residues							
manure							
textiles/leather							
diapers							
other misc. organics							
OTHER WASTES							
inert solids							
hazardous waste							
SPECIAL WASTES							
ash							
sewage sludge							
industrial sludge							
asbestos							
auto shredder waste							
auto bodies							
other special waste							
TOTAL							

Table 6. INDUSTRIAL DIVERSION PROGRAMS
(Purchaser)

PAPER						
corrugated containers						
newspaper						
high grade ledger paper						
mixed paper						
other paper						
PLASTICS						
HDPE containers						
PET containers						
film plastics						
other plastics						
GLASS						
refillable bev. containers						
CA Redemption Value						
other recyclable glass						
other non-recyclable glass						
METALS						
aluminum cans						
bi-metal containers						
tin cans						
other ferrous						
other aluminum						
other non-ferrous						
white goods						
YARD WASTE						
leaves, grass						
brush, branches						
OTHER ORGANICS						
food waste						
tires/rubber						
wood wastes						
agricultural crop residues						
manure						
textiles/leather						
diapers						
other misc. organics						
OTHER WASTES						
inert solids						
hazardous waste						
SPECIAL WASTES						
ash						
sewage sludge						
industrial sludge						
asbestos						
auto shredder waste						
auto bodies						
other special waste						

APPENDIX D

CONVERSION FACTORS
National Recycling Coalition
Densities for Recyclables

Figure 4: Sample Weight to Volume Conversion Factors for Recyclables

Material	Volume	Weight in Pounds
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

Material	Volume	Weight in Pounds
Ferrous cans, whole	one cubic yard	150
Ferrous cans, flattened	one cubic yard	850
Leaves, uncompacted[8]	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 ...." [9]

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

APPENDIX E

MODEL FOR CALCULATING DIVERSION RATE

Attachment 5 - Example of Diversion Rates by Material

(TONS, 1990)

	DISPOSED (a)	DIVERTED (b)		TOTAL GENERATED (c)	DIVERSION RATE (b/c) (percent)
		Recycling	Source Reduction		
PAPER (total)	22,145			30,114	
OCC/Kraft	4,722	4067	0	8,789	46
Magazines	1,028	0	0	1,028	0
Mixed Paper	7,349	0	0	7,349	0
Newsprint	4,006	3261	0	7,267	45
High Grade	804	641	0	1,445	44
Other Paper	4,235	0	0	4,235	0
PLASTICS (total)	6,263			6,315	
HDPE	1,260	0	0	1,260	0
PET	553	52	0	605	9
Film	2,101	0	0	2,101	0
Polystyrene Foam	332	0	0	332	0
Other Plastic	2,016	0	0	2,016	0
GLASS (total)	3,277			5,021	
Refillable Beverage	0	0	0	0	0
CA Redemption Value	477	1744	0	2,221	79
Other Recyclable	2,097	0	0	2,097	0
Other Non-Recyclable	703	0	0	703	0
METALS (total)	3,921			4,835	
Aluminum Cans	221	797	0	1,018	78
Other Aluminum	328	0	0	328	0
Bi-metal Cans	0	0	0	0	0
Steel Food & Bev. Cans	1,478	0	0	1,478	0
Other Ferrous	1,881	117	0	1,998	6
Other Non-ferrous	13	0	0	13	0
White Goods	0	0	0	0	0
YARD WASTE (total)	2,165			2,165	
Leaves and Grass	1,937	0	0	1,937	0
Branches and Brush	228	0	0	228	0
OTHER ORGANICS (total)	18,735			18,746	
Food	10,992	0	0	10,992	0
Rubber/Tires	422	0	0	422	0
Wood	1,126	0	0	1,126	0
Agri. Crop Residue	0	0	0	0	0
Manure	0	0	0	0	0
Textiles/Leather	1,845	8	0	1,853	0
Diapers	3,552	0	3	3,555	0
Other Organics	798	0	0	798	0
OTHER WASTES (total)	1,602			1,602	
Inert Solids	1,441	0	0	1,441	0
HHW	161	0	0	161	0
Appliances	0	0	0	0	0
SPECIAL WASTES (total)	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**	**68,797**	**16**

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1. EXECUTIVE SUMMARY

1.1 OVERVIEW OF HOUSEHOLD HAZARDOUS WASTE PROBLEM

Hazardous substances are prevalent in modern society, not only in the commercial and industrial sectors, but in the residential sectors as well. Hazardous substances can be found throughout the home, garage, garden, and hobby shop as constituents in such products as cleaners, paints, pesticides and glue. Once these products are no longer needed by the consumer, the unused portion is considered household hazardous waste (HHW). Improper disposal of HHW can pose a risk to human health and the environment and thus requires special handling.

A substance is classified as a hazardous waste by the Department of Health Services (DHS), California Code of Regulations (CCR) Title 22, if it demonstrates one of the following characteristics:

- ignitability - flammable (e.g., lighter fluid, spot and paint removers);
- corrosivity - eats away materials and can destroy human and animal tissue by chemical action (e.g., oven and toilet bowl cleaners);
- reactivity - creates an explosion or produces deadly vapors (e.g., bleach mixed with ammonia-based cleaners); and
- toxicity - capable of producing injury, illness, or damage to humans, domestic livestock, or wildlife through ingestion, inhalation, or absorption through any body surface (rat poison, cleaning fluids, pesticides, bleach).

Until the early 1980's, city and county-sponsored programs to properly manage HHW were virtually non-existent, thereby resulting in wastes being disposed in the garbage, down the sewer, into storm drains, or directly onto the ground. The improper disposal of hazardous wastes can result in contamination of ground and surface water and potentially hazardous leachate migration from solid waste landfills.

In response to the growing public awareness of the HHW issue, in 1985 the City of Cupertino began offering one-day collection

programs for these wastes. By 1987 a consortium with the cities of Los Altos and Mt. View had been established that offered three annual events to their residents.

The City is currently participating in the development and implementation of a new, countywide pilot HHW management effort aimed at providing ongoing, convenient and cost-effective collection services and public education for all residents.

1.2 HOUSEHOLD HAZARDOUS WASTE ELEMENT REQUIREMENTS

Assembly Bill 2707 requires that each city and the County for the unincorporated area characterize and quantify its HHW stream and develop plans for safe collection, recycling, treatment, and disposal of hazardous wastes generated by its households. An AB 2707 Household Hazardous Waste Element must be submitted to the County by each city and the County for the unincorporated area by July 1, 1991.

The County of Santa Clara Solid Waste Program staff anticipates that it will submit the city and unincorporated area HHW Elements to the California Integrated Waste Management Board (CIWMB) in 1994. The CIWMB will review each HHW Element no less frequently than every two years. If the Board finds that the City or County has failed to implement its Elements, the Board shall issue an order of compliance with a specific schedule for achieving compliance.

In Santa Clara County, a number of cities and the County for the unincorporated area have already agreed upon HHW management goals and have developed plans for a pilot multijurisdictional HHW collection and source reduction system. However, the California Integrated Waste Management Board (CIWMB) requires that each city and County for the unincorporated area provide its own AB 2707 Household Hazardous Waste Element. The CIWMB will not accept a countywide plan in place of city-specific HHW plans.

1.3 HHW PLANNING EFFORTS IN SANTA CLARA COUNTY

Background

With nearly 1.5 million residents, Santa Clara County ranks first in the Bay Area and fourth in the State in terms of population according to the Association of Bay Area Governments. The City of Cupertino is located in the South San Francisco Bay Area and has a total population of approximately 40,000. The County covers 1320 square miles, making it the second largest county in the San Francisco Bay Area. It is a diverse county encompassing both highly urbanized and as well as rural-agricultural areas. The County has experienced rapid population growth since the 1950's, with corresponding growth in solid waste and household hazardous waste generation.

Located at the southern end of the San Francisco Bay, Santa Clara County has a number of landfills located in close proximity to the Bay and wetland ecosystems. This, coupled with the fact that groundwater supplies 50 percent of the drinking water in Santa Clara County, requires that special measures be taken to protect the environment and groundwater by keeping hazardous waste out of landfills.

Household hazardous waste is generated in almost all homes, and until recently, residents have not had access to proper disposal options for this waste on an ongoing basis. As a result, HHW may be improperly disposed in sanitary landfills.

Santa Clara County cities have been in the forefront in California and the nation in developing HHW management programs. Cities have sponsored one or two-day HHW collection events and have set up curbside motor oil collection programs for their residents. Some cities sponsor additional HHW disposal programs at their drop-off recycling centers. Cities and non-profit organizations have developed and distributed educational materials that alert residents to the proper disposal methods for HHW and suggest alternatives to household products that generate hazardous waste.

The County has co-sponsored collection events for the unincorporated area with neighboring cities. Reciprocal agreements that allow participation in another jurisdiction's event have been utilized on a limited basis.

The success of past HHW programs has resulted in an increasing demand for services. However, because of the limited number of one or two-day HHW events available in most jurisdictions, the hazardous waste disposal needs of many County residents have not

been fully met. This is an acute problem for those with immediate disposal needs, such as residents who are moving.

This increasing demand, together with raising costs of HHW collection and disposal, led a number of local jurisdictions to the conclusion that one or two-day collection events alone do not offer a viable solution for meeting future needs. Additionally, there was a recognition that the problems associated with improper disposal of HHW are a regional issue and may require regional solutions.

The Household Hazardous Waste Working Group of the Santa Clara County Tanner Advisory Committee developed a set of goals for management of household hazardous waste in the County. The Working Group is composed of household hazardous waste program coordinators from cities; County hazardous waste, solid waste, and environmental health staff; private and solid waste contractors; and community advisory members. The Working Group developed the following HHW goals for the county.

TANNER PLAN HOUSEHOLD HAZARDOUS WASTE GOALS

- Keep household hazardous waste out of landfills, sanitary and storms sewers and waterways
- Reduce potential adverse effects of household hazardous waste on public health and safety
- Prevent harmful exposures in the home and environment through coordinated public education
- Provide services to all residents in the County

The Working Group determined that while most jurisdictions hold one-day collection events, a number of unmet needs remain in the county.

UNMET NEEDS

- Access to household hazardous waste collection on an "immediate need" basis (residents who are moving or otherwise need to dispose of materials rapidly)
- Access to ongoing collection centers
- Public education materials and programs that are consistent for all jurisdictions in the county.

These conclusions are echoed in the County's Hazardous Waste

Management Plan (Tanner Plan) of 1989 which states that:

> "The County and cities shall coordinate the development of a program for the proper management and disposal of household hazardous waste on a countywide basis in accordance with the waste management hierarchy and considering existing programs and conditions.

Under direction of staff to the Tanner Committee, a HHW Working Group began a planning effort to examine alternative program models and determine equitable and efficient methods of countywide service delivery. During the planning process, the group concluded that a countywide program might be more cost effective and provide greater access to service for county residents.

Countywide HHW Collection System

The Working Group recommended a HHW program to provide service via a mobile collection unit, with a permanent HHW facility to be added in the near future. The mobile unit will be located at neighborhood collection sites identified by the city HHW coordinators and will move to new locations throughout the county on a rotational basis. Residents of any participating jurisdiction will be eligible to use the mobile unit on an appointment-only basis at any of its scheduled stops throughout the County.

The mobile collection unit is expected to consist of a specially equipped vehicle and/or trailer, a portable chain link fence for security, and canopies to protect workers from the weather. The vehicle could contain an electric generator, a water system, as well as emergency and personal protective equipment and a small lab. A mobile trailer may provide storage space for supplies and equipment needed to conduct the mobile collections. The mobile unit would operate on an appointment basis.

The County Division of Environmental Health Services will serve as the lead agency for the administration and implementation of the countywide HHW program. Hazardous materials specialists and environmental health specialists will be utilized for development and initial implementation of the collection program. Health Department in-house support services include an industrial hygienist, a toxicologist, and a chemist. A public health laboratory will be available to augment to the on-site chemical identification kits used for identifying unlabeled wastes. Health Department staff will contract for transportation and disposal of the waste in compliance with federal, state, and local regulations.

The County of Santa Clara Department of Planning and Development

will serve as the lead agency for public education efforts. The Planning Department will coordinate with other agencies to maximize use of available resources and avoid duplication in the development of educational materials and programs. Educational projects will emphasize not only safe disposal practices, but also reduction in the use of potentially hazardous products.

A permanent HHW collection site is planned to begin operation in the near future. The permanent site will provide additional collection services and support the mobile collection program, by allowing expanded storage capabilities for more efficient consolidation of wastes prior to disposal. This may result in lower per unit disposal costs as well as additional opportunities to separate materials for reuse, treatment, or recycling. The permanent facility could also support a door-to-door HHW pickup service for elderly and disabled residents.

Participants

Thirteen jurisdictions are currently planning to participate in the Countywide pilot HHW program:

City of Campbell	City of Cupertino
City of Los Altos	Town of Los Altos Hills
Town of Los Gatos	City of Milpitas
City of Monte Sereno	City of Mountain View
City of San Jose	City of Santa Clara
City of Saratoga	City of Sunnyvale
County for the Unincorporated Area	

The Countywide pilot HHW program collection began in the fall of 1991. Some participating cites may rely entirely upon the Countywide program for collection of HHW. Other cities plan to use the Countywide program to augment existing HHW programs such as periodic drop off events and curbside oil collection programs.

While the Countywide HHW Program will be operated as a pilot project in its first year, it is anticipated that it will continue into the short-term (1991-1995) and medium-term (1996-2000) planning periods. At the end of the first year of operation, the program will be evaluated. Participating cities will decide if and to what extent they wish to continue participation in the

Countywide HHW program. Cities not currently participating in the pilot program in 1991-1992 may decide to join the Countywide HHW Program at some later date.

2. HOUSEHOLD HAZARDOUS WASTE ELEMENT FOR CITY OF CUPERTINO

2.1 GOALS

Improper disposal of household hazardous waste will be reduced or eliminated in the City of Cupertino in the short-term and medium-term planning periods. Generation of household hazardous waste will be reduced through source reduction efforts. Household hazardous waste generated by residents will be safely collected, recycled, treated or disposed.

2.2 OBJECTIVES FOR SHORT-TERM PLANNING PERIOD (1991-1995)

Objective #1 Provide Residents of Cupertino Access To Convenient Household Hazardous Waste Collection Services

MOBILE COLLECTION UNIT. City of Cupertino plans to participate in the Countywide HHW Program which will provide the residents with year round collection services. The mobile unit will operate in close proximity of most City residents one to two times per year. In addition, residents in need of immediate disposal services can deliver their HHW, by appointment, to the mobile collection unit at any location in the County.

TELEPHONE APPOINTMENT AND INFORMATION TELEPHONE SERVICE. The Countywide HHW Program will initially operate on an appointment-only basis. The County Division of Environmental Health Services will operate the telephone appointment and information line for the mobile collection unit and the permanent HHW facility.

TELEPHONE INFORMATION SERVICE. The City of Cupertino will continue to provide information regarding Household Hazardous Waste by telephone. It is anticipated that the majority of calls will be referred to the Countywide program for screening.

PERMANENT FACILITY. The City of Cupertino intends to participate in the Countywide HHW Program plan to develop and operate a permanent HHW collection facility in addition to the mobile collection unit.

PERIODIC DROP OFF DAYS. The City of Cupertino will discontinue their HHW Drop Off Days and intends to participate in the Countywide HHW Program.

Objective #2 Expand Curbside Motor Oil Collection Programs, To The Maximum Extent Possible, To Include All Single And Multifamily Dwellings In The City Of Cupertino

EXPAND COLLECTION. Existing curbside motor oil collection programs will be gradually expanded. For those dwellings where collection of motor oil is not practical, special public informational efforts will notify residents of most convenient drop off locations.

INCREASE PARTICIPATION. In areas where participation is low, special publicity and educational efforts will be conducted to increase the percentage of residents using the curbside motor oil collection service and/or drop off locations.

Objective #3 Minimize Disposal Of Collected HHW Through Distribution Of Reusable Materials And HHW Recycling

DISTRIBUTION TO AGENCIES AND MUNICIPAL DEPARTMENTS. When practical, usable materials such as paint and automotive maintenance products will be offered to nonprofit agencies, and city and county departments.

DISTRIBUTION AT COLLECTION EVENTS. When practical, reuse tables will be operated at HHW collections events to allow residents to select usable products.

RECYCLING. To the maximum extent possible, HHW such as paint, motor oil, and automotive batteries will be separated from incoming waste and sent away for recycling.

Objective #4 Improve Monitoring And Evaluation Of HHW Programs

The City of Cupertino intends to participate in the development of countywide standardized methods for measuring collected HHW.

Objective #5 Limit Improper Disposal Of Hazardous Waste At Solid Waste Landfills By Continuing State-Mandated Hazardous Waste Exclusion Programs

LOAD CHECKING, SIGN POSTING, TRAINING, AND CUSTOMER NOTIFICATION. Incoming solid waste at Newby Island and Zanker landfills, which serve the City of Cupertino, will be monitored by load checking programs under the oversight of County Environmental Health, the local enforcement agency, as required by the Regional Water Quality Control Board. Landfill operators will carry out required sign

posting, employee training and customer notification regarding the prohibition of HHW from landfill disposal.

Objective #6 Increase Efficiency And Effectiveness Of HHW Collection Services And Public Education By Coordinating Programs With Other Jurisdictions And Agencies Whenever Feasible

HHW MANAGEMENT IN SANTA CLARA COUNTY. The cities of Campbell, Cupertino, Los Altos, Milpitas, Monte Sereno, Mountain View, Sunnyvale, San Jose, Santa Clara, Saratoga; the Towns of Los Altos Hills and Los Gatos; and the County for the Unincorporated area; County Hazardous Waste Management Program County Environmental Health Services; County Solid Waste Program intend to participate in cooperative HHW management efforts. The Nonpoint Source Pollution Control Program, the wastewater treatment plants, community advisory persons, schools, and nonprofit organizations will be included in this multijurisdictional effort.

Objective #7 Decrease Potential Short And Long-Term Liability Risks By Monitoring Environmental Compliance Records And Proof Of Insurance Of Contract Waste Haulers And Contract Treatment, Storage And Disposal Facilities

ENVIRONMENTAL COMPLIANCE. The past three years' environmental compliance records of all hazardous waste contractors will be examined by the Department of Environmental Health Services.

SITE AUDITS. Audits of facilities under consideration will be conducted by Environmental Health Services to confirm safe waste management methods.

LIABILITY INSURANCE. Proof of adequate liability insurance will be required and be kept on file.

The verification of environmental compliance will be done by Santa Clara County Department of Environmental Health Services.

Objective #8 Increase Source Reduction Options For Residents By Supporting Legislative Efforts Aimed At Promoting Development Of Safer Products And Safer HHW Management Methods

LEGISLATIVE EFFORTS. The City will initiate, endorse, support efforts to require manufacturers to market less hazardous or non-hazardous products. Increased recycling options for household

hazardous wastes may also be encouraged through the support of legislation.

2.3 OBJECTIVES FOR MEDIUM-TERM PLANNING PERIOD (1996-2000)

Landfill disposal of household hazardous waste will be further reduced or eliminated in the City of Cupertino in the medium term planning period (1996-2000) by achievement of the following objectives:

Objective #1 Continue The Objectives Developed For The Short-Term Planning Period Into The Medium-Term Planning Period

Objective #2 Increase Source Reduction Efforts

2.4 TARGETED AND EXCLUDED MATERIALS

Household materials that have the characteristics of hazardous waste, as defined by Section 25117 of the Health and Safety Code, have been targeted for collection by the City of Cupertino. See Attachment 1 for Section 25117 of the Health and Safety Code.

Several types of materials are excluded from HHW collection programs due to potential hazards to the public and collection program staff. Ammunition and explosives will not be accepted. Residents who request disposal services for ammunition or explosives will be referred to the police or fire department. Compressed gas cylinders; i.e., propane tanks; over 20 lbs., will not be accepted. Residents will be referred to dealers for disposal of gas cylinders.

Medical wastes will not be accepted. Residents requesting disposal services for medical wastes will be advised of proper disposal methods for specific types of waste materials. Radioactive waste will not be accepted. Smoke alarms, the common household product containing radioactive materials, is considered "Below Regulatory Concern" and may be discarded with household solid waste.

3.1 QUANTITY OF HOUSEHOLD HAZARDOUS WASTE GENERATED BY THE CITY OF CUPERTINO

The 1991 waste characterization study done at Zanker Resource Recovery Site indicates that 0.4% of the City's landfill waste stream was identified as HHW. Therefore, approximately 158 tons of HHW is being improperly disposed in the landfill annually by City residents.

In 1990, 33 tons of HHW was collected by city-sponsored HHW collection programs and the curbside oil collection service. This figure was derived by converting amount of gallons collected to pounds and tons. The following conversion method is suggested for use at this time.

1 gallon of liquid (other than oil) = 8.6 lbs. (Source: Santa Clara County Department of Weights and Measures)

1 gallon of used motor oil = 7.6 lbs. (Sources: Santa Clara County Department of Weights and Measures, State Division of Measurement Standards, and Evergreen Oil, Inc.)

1 automotive battery = 34 lbs. (Source: County Environmental Health)

55 gallon drum of lab-packed wastes = 20 gallons of liquid (Source: County Hazardous Waste Management Program) 1 gallon of paint weighs about 8 pounds (Source: Romic Chemical Corporation)

55 gallon drum of consolidated oil-based paint = 55 gallons of paint (Source: Palo Alto Public Works) 1 gallon of paint weighs about 8 pounds (Source: Romic Chemical Corporation)

It can therefore be estimated that 191 tons of HHW was generated in the City in 1990 of which 158 tons was improperly disposed and 33 tons waste disposed of properly. Table 3.1 summarizes HHW disposed in the City of Cupertino.

Table 3.1
HHW Disposed in City of Cupertino, 1990

Total Tonnage Solid Waste	36,392	Tons
%Identified as HHW	0.4%	
Tonnage HHW in Solid Waste Stream (Total Tonnage x %HHW) (improperly disposed)	158	Tons
Tonnage HHW Collected at Events in 1990 (properly managed)	17	Tons
Tonnage of Used Motor Oil Collected at Curbside in 1990 (properly managed)	16	Tons
Amount of HHW Discovered in Landfill Load Checking Program	N/A	
Total Tonnage Diverted in 1990 (properly managed)	33	Tons
Number of Households in 1990	14,700	+/-
Estimated HHW Disposed per Household	26 lbs	

3.2 TYPES AND AMOUNTS OF HHW DIVERTED

The types of HHW and amounts collected by city-sponsored collection events and programs in the City of Cupertino in 1990 are shown on the CIWMB Form 303 "Household Hazardous Waste Collection Information" included as Attachment 2.

3.3 EXISTING SOURCE REDUCTION, COLLECTION, RECYCLING, TREATMENT AND DISPOSAL PROGRAMS

Between 1988 and 1990, several types of household hazardous waste collection and recycling programs were developed and implemented in the City of Cupertino. By 1990, the city sponsored the following programs.

1. Periodic Drop off Events
2. Curbside Motor Oil Collection
3. Automotive Battery and Oil Drop off

3.3.1 Periodic Drop-off Events

The City of Cupertino has sponsored 13 HHW periodic drop off events between 1986 and 1990. As shown below in Table 3.2 three events were held in 1990; a total of 488 residents participated. Eighteen (18) tons of waste were collected during this period.

Table 3.2
Periodic Drop off Events in the City of Cupertino 1990

Date	Total Number Of Households	# Households Participating	Amount Collected Tons
4/90	14,700	97	2.35
7/90	14,700	179	10.81
10/90	14,700	212	4.27
TOTAL		488	17 +/- tons

3.3.2 Total Curbside Motor Oil Collection

The City of Cupertino began curbside used oil collection in 1989. Table 3.3 shows the number of households served, the amount collected, and the percent of eligible households participating in the curbside oil collection programs. The number of unserved households in each jurisdiction is included as well.

Table 3.3
Curbside Oil Collection in the City of Cupertino, 1989-1990

Year	Total Households	Amount Collected Tons
1990	14,700	16

(Note: The purpose of converting gallons of oil into tons of oil is to assist in reporting the overall amount of HHW collected.)

3.3.3 Automotive Battery and Oil Drop-Off At Recycling Center

Automotive batteries and motor oil were collected at the De Anza College recycling drop off center in the City. Table 3.4 shows the amounts of automotive batteries and motor oil collected at the drop off program in 1990.

Table 3.4.
Automotive Battery and Motor Oil Drop-off

Year	Auto Batteries #Collected/Tons	Motor Oil Gallons/Tons
1990	50 /1 Ton	26,000 gal./99 Tons

3.3.4 Hazardous Waste Exclusion Program

The objective of the Hazardous Waste Exclusion Program is to discourage the improper disposal of hazardous waste at the solid waste disposal facility. Solid waste generated in the City is landfilled at Newby Island landfill. All landfills are required to implement hazardous waste exclusion programs. The Hazardous Waste Exclusion Program consists of the following components.

Load Checking at Newby Island Landfill

Load checking involves inspection of incoming solid waste, landfill employee training, state and county-mandated hazardous waste handling and reporting procedures.

Landfill Public Awareness Efforts

Landfill public awareness efforts include sign posting at landfill entrances and unloading areas, verbal instructions to residents using landfill, and answering phone inquiries regarding waste disposal.

3.4 MANAGEMENT OF HHW DIVERTED FROM LANDFILL DISPOSAL IN 1990

The City of Cupertino ascribes to the disposal hierarchy "Reduce, Reuse, Recycle, Treat, Dispose" for management of collected HHW. The management methods for diverted HHW is included in

Attachment 2. A total of 18 tons of HHW was collected at the 1990 events; 25% was recycled, 20% treated, and 55% hazardous waste landfilled. A description of the recycling, treatment and disposal methods for HHW is included in Chapter 5, Section 5.9 and Chapter 6, Section 6.5. and on CIWMB Form 303 which is included in Form 303, included as Attachment 2.

3.5 FUTURE STATUS OF EXISTING PROGRAMS

During the first year of operation, the mobile collection unit will operate in the City of Cupertino once per year. The mobile unit will be available to residents while operating in other cities approximately twenty times per year. The City of Cupertino intends to contribute $30,000 for services of the Countywide HHW program for the first 12 months. This level of commitment to the Countywide Program will provide 300 households with HHW collection services. The City will determine future level of service and financial commitment to the Countywide HHW Program on an annual basis in the short and medium-term planning periods.

Existing HHW waste exchange activities and city-sponsored public education activities will be incorporated into the Countywide HHW Program. Other regional public education efforts (Nonpoint Source Program, Non-profits, etc.), are expected to continue into the short and medium-term planning periods. The curbside motor oil collection program will continue. The hazardous waste exclusion activities at the landfill(s) are expected to continue into the short and medium-term planning periods.

4. METHODOLOGY FOR EVALUATION OF HHW MANAGEMENT ALTERNATIVES

The following evaluation methodology was developed by EMCON Associates. Additional criteria; "Availability of Service" and "Provides Immediate Disposal Services"; were added to reflect needs of other Santa Clara County communities. The evaluation criteria is consistent with the evaluation procedure outlined in Intergrated Waste Management Board's Draft Planning Guidelines for Source Reduction and Recycling Elements.

4.1 EVALUATION CRITERIA

The following twelve criteria have been rated using scale of high, medium, and low, with high being positive. Ten alternatives for managing HHW were evaluated. The evaluation was summarized in Table 5.1 which is included as Attachment 3.

4.1.1 Waste Diversion Potential

Waste diversion potential is the estimated ability of the alternative to reduce the amount of HHW improperly disposed in the landfill. Waste diversion potential measures the alternative's ability to accept, handle, recycle or properly dispose of HHW.

Low: The alternative has low potential to divert HHW.

Medium: The alternative is likely to divert some HHW.

High: The alternative is likely to divert large amounts of HHW.

4.1.2 Absence of Hazard

Absence of hazard reflects the extent to which hazards result from the alternative. Hazards could include health risks, injury, fire, or other.

Low: Potential hazards are not completely understood, or the alternative presents potential hazards.

Medium: Potential hazards are known and controllable. Some impacts remain.

High: There are few or no potential hazards or unmitigated impacts.

4.1.3 Flexibility

Flexibility measures the adaptability to changing economic, technological, and social conditions.

Low: The alternative is limited in adaptability to changing conditions.

Medium: The alternative is anticipated to have a moderate adaptability to changing conditions.

High: The alternative can be readily adapted to meet changing conditions.

4.1.4 Availability of Service (Nearby and Frequent Services)

Availability of service is a consideration of travel distance for participants and frequency of service. Optimal travel distance was determined to be no more than a 20 minute commute from residents' homes. Optimal frequency of service was determined to be at least two disposal opportunities per year within the 20 minute commute distance.

Low: The alternative does not provide services within a 20 minute commute. Cost or logistical barriers make frequent service with this alternative difficult.

Medium: The alternative has potential to provide disposal services within a 20 minute commute. The alternative has the potential for frequent service.

High: The alternative is designed to provide disposal services within a 20 minute commute and frequent service is not hindered by cost or logistical barriers, in comparison with other alternatives.

4.1.5 Provides Immediate Need Disposal Services

Provides immediate need disposal service refers to the alternative ability to provide disposal services within several days of a request. Residents who are moving often request HHW disposal services. If disposal services are not available, these residents may improperly dispose of their stored HHW.

Low:	The alternative does not accommodate needs of residents requesting immediate disposal services.
Medium:	The alternative may provide some immediate need services.
High:	The alternative has flexibility to accommodate residents requesting immediate disposal of HHW.

4.1.6 Limited Shift in Waste Type Generation

Limited shift in waste type generation measures the alternative's ability to limit consequences of diversion of one material at the expense of increased generation of another material.

Low:	The alternative would significantly shift waste production to generation of non-recyclable, non-marketable, or more hazardous materials.
Medium:	The alternative would result in the creation of little shift toward non-recyclable, non-marketable, or more hazardous wastes.
High:	The alternative would result in no shift toward non-recyclable, non-marketable, or more hazardous wastes.

4.1.7 Ease of Implementation

Ease of implementation measures the speed with which the alternative can be brought into service, i.e., whether it can be implemented in the short-term or medium-term planning periods.

Low: Implementation of the alternative could not be completed until after 2000.

Medium: Implementation of the alternative is anticipated to be completed between 1995 and 2000. This is the medium-term planning period.

High: Implementation of the alternative is anticipated to be completed by 1995. This is the short-term planning period.

4.1.8 Facility Need

Facility need measures the need to expand existing facilities or build new facilities to support the implementation of the alternative.

Low: New facilities must be developed to accommodate the alternative.

Medium: Existing facilities must be expanded or altered to accommodate the alternative.

High: The alternative requires no new facilities or modification of facilities.

4.1.9 Consistency with Local Policies

Consistency with local policies measures the alternative's compatibility with existing local plans, policies, and ordinances.

Low: The alternative would require major changes to existing local plans, policies, or ordinances.

Medium: The alternative would require minor changes to existing local plans, policies, or ordinances.

High: There are no existing local plans, policies of ordinances that would impede the implementation of the alternative.

4.1.10 Absence of Institutional Barriers

Absence of institutional barriers evaluates the extent to which institutional barriers, such as long-term franchise agreements or other contracts, or other barriers, may impact local implementation of the alternative.

Low: The alternative is impacted by existing institutional barriers which are not under the control of the jurisdiction.

Medium: The alternative is impacted by existing institutional barriers over which the jurisdiction maintains some control.

High: There are no existing institutional barriers to the alternative.

4.1.11 Estimated Cost

Estimated cost evaluates the projected cost of the alternative, including capital costs and operating costs for the short-term and medium-term planning period.

4.1.12 End Uses (Recyclability and Redistribution Potential)

End uses measures the recycling or reuse potential of collected HHW products.

Low: Recycling or redistribution activities are incompatible with the alternative.

Medium: The alternative might allow for recycling/redistribution.

High: Recycling or redistribution activities are compatible with the alternative.

5. EVALUATION OF HOUSEHOLD HAZARDOUS WASTE MANAGEMENT ALTERNATIVES

This section presents an evaluation of alternatives that were considered by the City of Cupertino to meet its HHW management objectives, using the criteria described above in Chapter 4. The following ton alternatives were evaluated. The results of the evaluation are summarized in Table 5.1. (See Attachment 3)

Alternative	1	Periodic HHW Drop off Events
Alternative	2	Five Permanent HHW Facilities
Alternative	3	Mobile Collection
Alternative	4	Combination - Mobile Unit Plus One Permanent Facility
Alternative	5	Curbside Motor Oil Collection
Alternative	6	Door-to-Door Pickup for Elderly and Disabled Residents
Alternative	7	Hazardous Waste Exclusion Program
Alternative	8	Household Hazardous Waste Recycling Component
Alternative	9	Household Hazardous Waste Exchange

An additional method of HHW management was considered: curbside HHW collection. This method was not included in the "Evaluation of Alternatives" due to unacceptably high potential public health risks. HHW set at the curbside could be blown over or rained upon, resulting in toxic run-off into the storm drain system. Children or pets could tamper with materials left at the curb, and waste haulers could be harmed if residents set out unacceptable types or amounts of wastes.

Curbside HHW collection programs that accept all types of HHW have not been implemented in California. Unlike programs that collect motor oil at the curb, it is not known if permits could be obtained to collect all types of HHW in this manner. The permitting process for curbside HHW collection was not explored as the alternative was deemed unfeasible due to potential health and safety hazards.

5.1 EVALUATION OF ALTERNATIVE 1 - PERIODIC DROP-OFF EVENTS

The City of Cupertino has sponsored periodic drop off events since 1985. These events have been scheduled, on the average, three per year. Events have been held in each co- sponsors jurisdiction and have had the participation of 488 Cupertino residents in 1990.

WASTE DIVERSION POTENTIAL. Periodic events have proven to be ineffective in collecting large amounts of HHW. The City rated the waste diversion potential of periodic drop off events as "low". Only 1% of the total population of the City has participated in these events.

ABSENCE OF HAZARD. Potential public health risks and safety hazards associated with any HHW collection method include spills, fires, leaks, or explosions resulting from improper collection, storage, handling, or transport of hazardous material. However, proper design, equipment, and health and safety training minimize potential hazards. Periodic drop off events were rated as "medium" in absence of hazard.

FLEXIBILITY. Periodic drop off events have a limited ability to respond to unanticipated conditions, such as an unexpectedly high turnout. On the other hand, periodic events are flexible in the sense that, if funding permits, a city can decide to hold more frequent events to accommodate high demand in a safer, more orderly manner. A "medium" rating was assigned.

AVAILABILITY OF SERVICE (Nearby And Frequent Service). Availability of service refers to the alternative's ability to provide HHW disposal services within a 20 minute commute of residents' homes and at optimally, four times per year. The periodic drop off event alternative was rated "medium" as these events are generally held in one centralized location and only three times per year. However, additional events and event locations could be added.

PROVIDES IMMEDIATE NEED DISPOSAL SERVICES. Periodic drop off events have generally operated three days per year, although the possibility exists to hold such events more frequently. The periodic drop off event alternative was rated "low" in its ability to provide immediate need disposal services.

LIMITED SHIFT IN WASTE TYPE GENERATION. Not applicable.

EASE OF IMPLEMENTATION. The City of Cupertino has co-sponsored 13 periodic drop off events and is familiar with the planning and implementation procedures. Should the City decide to continue operation of periodic drop off events, it is anticipated that such events could be implemented within the short-term planning period (before 1995). Ease of implementation was therefore rated "high".

FACILITY NEEDS. Periodic drop off events do not require expansion or development of facilities and were rated "high."

CONSISTENCY WITH LOCAL POLICIES. The City of Cupertino has sponsored 13 periodic events in the past 6 years, indicating that this alternative is consistent with local policies and ordinances. However, the periodic events do not meet the needs of residents requesting immediate disposal services or provide ongoing collection services as recommended in the County Hazardous Waste Management (Tanner) Plan. A "medium" rating was assigned.

ABSENCE OF INSTITUTIONAL BARRIERS. No institutional barriers, such as existing contracts, would impede the City of Cupertino in implementing periodic drop off events. A "high" rating was assigned.

ESTIMATED COST. In calendar year 1990, the City of Cupertino spent $52,861 to operate three HHW collection events. This amount includes the contractor's fee for management of the events and disposal of collected waste. Additional costs for the program are city planning time, advertising, donated equipment, and volunteer labor. A total of 488 residents were served in 1990.

A preliminary cost analysis of past periodic events throughout the county indicates considerable variation in cost between city events. Factors contributing to the cost variations include amount of volunteer labor and other donated services used to plan and operate the events.

Costs for HHW collection alternatives under consideration (periodic; mobile, five permanent facilities; and combination mobile and one permanent facility) are driven primarily by siting, waste disposal, event staffing, and capital expenditures. It was estimated that the cost per vehicle service at all four of these options would be within the $90 - $110 range.

END USES (Recyclability And Redistribution Potential). Periodic collection events divert latex paint, oil, and automotive batteries from landfill disposal for recycling. However, lacking storage space and permits to store materials, periodic events are limited in their ability to promote redistribution of usable products. A "medium" rating was assigned.

5.2 EVALUATION OF ALTERNATIVE 2 - FIVE PERMANENT FACILITIES

In this alternative, five permanent HHW collection facilities would be located throughout the county to provide HHW collection services within a 20 minute commute for a majority of residents in participating communities. The program would be administered by the Countywide HHW Program. Each city would determine, on an annual basis, the desired level of HHW services for its residents.

WASTE DIVERSION POTENTIAL. Five permanent facilities may process participants more efficiently than collection events because of the presence of more extensive equipment and greater storage capabilities. Permanent facilities can provide comprehensive, ongoing disposal services and was rated "high" for waste diversion potential.

ABSENCE OF HAZARD. Permanent facilities can provide a safe means of collecting and properly disposing of HHW. Proper design, equipment, and permanent staff can minimize potential hazards associated with HHW collection. The permanent facilities alternative received a "high" rating.

FLEXIBILITY. Permanent facilities do not have the flexibility to operate in various locations as do periodic collection events or a mobile collection unit. However, permanent facilities can accommodate changing social conditions, such as increasing demand for service, by adjusting the days of operation. A permanent facility can also serve as a "hub" for a mobile collects HHW from elderly and disabled resident. This alternative received a "high" rating.

AVAILABILITY OF SERVICE (Nearby And Frequent Service). The five permanent facilities alternative has the potential to provide frequent services, depending on the number of days the facility is open. Residents from any participating community could use the permanent facilities. Facilities could be located so that most residents would have a 20 minute or less commute to the nearest facility. The five permanent facilities alternative was rated "high."

PROVIDES IMMEDIATE NEED SERVICES. The five permanent facilities alternative was rated "high" in its ability to provide immediate need services.

LIMITED SHIFT IN WASTE TYPE GENERATION. Not applicable.

EASE OF IMPLEMENTATION. The implementation phase for permanent facilities requires site selection, environmental review, permitting, Board of Supervisors' approval, and construction. In addition, the siting of permanent facilities may be subject to the Tanner Plan review process. The implementation of five permanent facilities could extend beyond the short-term planning period (1991 to 1995) and therefore received at "medium" rating.

FACILITY NEEDS. This alternative requires the location or construction of collection and storage facilities. A HHW facility must meet local, state and federal safety and operating standards. A facility should have separate storage bays or bins to prevent

spilled or leaked incompatible wastes from mixing. A collection and storage building may need explosion proofing; ground columns; proper containment; and sufficient ventilation. Adequate emergency response and safety equipment would be necessary. A permanent facility should be situated on an impervious surface and fenced for security. A "low" rating was assigned to this alternative due to the complexity of facility needs for five permanent facilities.

CONSISTENCY WITH LOCAL POLICIES. The five permanent facilities alternative appears to be consistent with the Tanner Plan recommendations to provide ongoing and immediate need disposal services for all residents. However, a land use decision may be required by the local planning commission. A "medium" rating was assigned.

ABSENCE OF INSTITUTIONAL BARRIERS. No contractual or other institutional barriers exist to implementing the five permanent facilities alternative. A "high" rating was assigned.

ESTIMATED COST. A preliminary cost analysis for the five permanent facilities indicates that the cost of this alternative is dependent, to a large extent, on two factors; availability of sites and facility design.

If appropriate sites could be located that did not require purchase of land, the cost of this alternative would be significantly lower. It might be possible to site permanent HHW facilities at existing landfills, transfer stations, materials recovery facilities, wastewater treatment plants, or public works facilities. However, if siting permanent facilities requires the purchase of property, or if residents opposed the siting of such facilities, a significant increase in cost would result.

The second factor that would affect the cost is the actual design of the facilities. A range of options exists for structural design and equipment for permanent HHW facilities. These factors would greatly influence cost of implementing the five permanent facilities alternative. The cost estimates used here assume permanent facilities consisting of slightly modified existing structures and/or the use of roll-off bins for waste collection and storage.

It was estimated that it might be possible to implement the five permanent facilities alternative at a cost similar to costs for the other HHW collection alternatives under consideration (periodic; mobile; and combination mobile and one permanent facility). Costs of all options are driven primarily by siting, waste disposal, event staffing , and capital expenditures. It was estimated that the cost per vehicle service at all four of these options would be

within the $90 - $110 range. However, the unknown factors regarding facility siting and design could significantly change this estimate.

END USES (Recyclability And Redistribution Potential). Valuable materials diverted from the incoming waste stream can be stored at a permanent facility, thereby making waste exchange or organized waste referral services feasible. The presence of permanent, trained staff enhances ability to carry out recycling and redistribution activities. The five permanent facilities alternative received a "high" rating for recycling/redistribution potential.

5.3 EVALUATION OF ALTERNATIVE 3 - MOBILE COLLECTION

A mobile collection program consists of a modified collection vehicle or vehicles which may contain an electric generator, compressor, and water system; a fire response system; emergency equipment; and a lab for identification of unlabeled HHW. A mobile facility can be dismantled in a short time once a collection event is completed. This alternative assumes no permanent sites would be developed.

WASTE DIVERSION POTENTIAL. A mobile collection program is an effective approach for HHW collection in a large geographical area. A "high" rating was assigned to this alternative.

ABSENCE OF HAZARD. The mobile collection alternative involves more transportation of equipment and staff than a permanent facility and therefore, presents a slightly higher risk of hazard. Proper design, equipment, as well as safety training can minimize potential hazard. The potential for risks to the public health associated with mobile collection was rated as "medium."

FLEXIBILITY. A mobile collection unit is highly flexible as both location and frequency of operation can be readily changed to accommodate variations in demand or shifts in population density. However, because of location changes, sufficient advertising must be done to notify the public of the exact location. In addition, finding sites with adequate and safe accessibility might be difficult in some areas. The mobile unit receive a "high" rating in ability to accommodate changing conditions in a large geographical area.

AVAILABILITY OF SERVICE (Nearby And Frequent Service). The mobile unit would be scheduled to operate in approximately 20 locations throughout the county during the first year of operation. Most

residents will have a maximum 20 minute drive to the unit. The mobile unit's operating schedule could be modified to include additional collection locations or more frequent service as needed. Additional locations and days of operation may be added annually throughout the short- and medium-term planning period. The mobile collection unit was rated "high" for availability of service.

PROVIDES IMMEDIATE NEED DISPOSAL SERVICES. The mobile unit would operate at the various locations in the county on a rotational basis. Residents in need of immediate disposal services will be able to deliver their HHW, by appointment, to the mobile unit at its next scheduled day of operation anywhere in the county. A "high" rating was assigned to this alternative for ability to provide immediate disposal services.

LIMITED SHIFT IN WASTE TYPE GENERATION. Not applicable.

EASE OF IMPLEMENTATION. It appears likely that a mobile program could be permitted by the Department of Health Services under the Permit By Rule regulations for "temporary events". These regulations are currently under development and are expected to be finalized in mid-1991. Therefore, it is likely that a mobile program could be implemented in the short-term planning period (before 1995). A "high" rating was assigned to the mobile collection alternative.

FACILITY NEEDS. The mobile collection unit requires a modified vehicle or vehicles and equipment. However, no purchase of land or construction of facilities is required. The mobile collection alternative was rated "high" for facility needs.

CONSISTENCY WITH LOCAL POLICIES. The mobile collection program was determined to be a HHW management technique best able to provide ongoing and immediate need services to residents in a large geographical area. This alternative is expected to require a less complex siting process due the temporary nature of the mobile unit stopovers. The mobile collection unit alternative was rated "high" in consistency with local policies that recommend Countywide access to ongoing HHW collection services.

ABSENCE OF INSTITUTIONAL BARRIERS. No regulatory prohibitions or contractual barriers exist to implementing a mobile HHW collection program. A "high" rating was assigned.

ESTIMATED COST. A preliminary cost analysis for the mobile HHW collection alternative indicates that this alternative might be implemented at a cost similar to the periodic events alternative, five permanent facilities alternative, and the combination mobile unit plus one permanent site alternative. Costs of all options are

driven primarily by siting, waste disposal, event staffing, and capital expenditures. It was estimated that the cost per vehicle service at all four of these options would be within the $90 - $110 range.

END USES (Recyclability And Redistribution Potential). A mobile collection unit can divert materials for recycling and can include a HHW waste exchange component. However, limited space prevents storage of reusable products for distribution at future events. Therefore, this alternative was rated "medium" in recyclability/redistribution potential.

5.4 EVALUATION OF ALTERNATIVE 4 - COMBINATION PROGRAM: MOBILE UNIT PLUS PERMANENT FACILITY

The combination program consists of a mobile unit plus one permanent facility. The permanent facility would be located in a densely populated urban area and the mobile unit would operate in the cities and unincorporated area throughout the County on a rotating basis. The number of vehicles served will be adjusted in response to demand for services and availability of funds.

WASTE DIVERSION POTENTIAL. The mobile unit plus permanent facility alternative could provide convenient, cost-effective service to both a densely populated area and large geographical region. A "high" rating was assigned to the combination alternative.

ABSENCE OF HAZARD. The mobile unit involves more movement of equipment and materials than the permanent facility. The majority of collected HHW would be removed directly from the mobile unit by licensed waste haulers. To minimize waste disposal costs, partially-filled lab packed drums might be delivered to the permanent facility to await additional waste. Proper equipment, training, and operating procedures would minimize the potential hazards. A "medium/high" rating was assigned to the combination mobile plus one permanent facility alternative.

FLEXIBILITY. Depending on demand for services, days of operation of the mobile unit and permanent facility can be adjusted. The mobile unit's schedule can be modified to include additional locations as needed. A special effort to notify residents of changing location would be necessary. In addition, multilingual advertising and telephone appointment services may be necessary. The combination alternative received a "high" rating in its ability to respond to changing social conditions.

AVAILABILITY OF SERVICE (Nearby And Frequent Service). The combination alternative will provide HHW disposal services within a 20 minute commute for most residents in the participating cities. Depending on demand for services, frequency of both of these collection services can be expanded in the short and medium-term planning period. A "high" rating was assigned to the combination alternative.

PROVIDES IMMEDIATE NEED SERVICES. A "high" rating was assigned, as residents from any of the participating cities could be able to deliver HHW, by appointment, to the next operating day of either the permanent facility or the mobile unit.

LIMITED SHIFT IN WASTE TYPE GENERATION. Not applicable.

EASE OF IMPLEMENTATION. It appears likely that a mobile program could be permitted by the Department of Health Services under the Permit By Rule regulations for "temporary events". The Permit By Rule regulations are currently under development by the Department of Health Services and are expected to be finalized in mid-1991. Therefore, it is likely that a mobile program could be implemented in the short-term planning period (before 1995). A "high" rating was assigned to the mobile collection alternative.

The implementation phase for a permanent facility includes site selection, environmental review, permitting, Board of Supervisors' approval, and possibly, facility construction or modification of existing structures. Regulations for siting permanent HHW facilities are under development by the California Department of Health Services and are expected to be in place by late 1991. In addition, the siting of a permanent facility may be subject to the Tanner Plan review process. It appears likely that one permanent facility could be operational before the end of the short-term planning period (before 1995). A "high" rating was assigned.

FACILITY NEEDS. The mobile collection unit requires a waste collection and storage equipment. However, no purchase of land or construction of facilities is required.

The permanent facility will require either location of appropriate site for storage roll-off bins or the construction or modification of a collection and storage structure.

A "medium" rating was assigned to the combination mobile unit plus one permanent facility alternative.

CONSISTENT WITH LOCAL POLICIES. Countywide planning efforts have determined that the combination of a mobile unit and a permanent facility for HHW collection appears to be the alternative that best

meets the needs of the participating cities. This alternative appears to be consistent with the Tanner Plan recommendations for ongoing, convenient, and immediate need services.

The mobile collection unit requires siting a number of temporary locations and the process of siting a permanent facility may be complex. A "medium" rating was assigned to the combination alternative.

ABSENCE OF INSTITUTIONAL BARRIERS. No institutional barriers are known that would prevent the implementation of the combination alternative. A rating of "high" was assigned.

ESTIMATED COST. A preliminary cost analysis for the combination mobile unit plus one permanent facility alternative indicates that this alternative might be implemented at a cost similar to the cost of the periodic events alternative, the mobile collection program alternative, or the five permanent facility alternatives.

A preliminary cost analysis for a permanent facility indicates that the cost of this alternative is dependent, to a large extent, on two factors; availability of sites and facility design.

If an appropriate site could be located that did not require purchase of land, the cost of this alternative would be significantly lower. It might be possible to site a permanent HHW facility and existing landfill, wastewater treatment plant, or public works facility. However, if siting a permanent facility requires the purchase of property, or if residents opposed the siting of a facility, a significant increase in cost would result.

The second factor that would affect the cost is the actual design of the facility. A range of options exists for structural design and equipment for permanent HHW facilities. These factors would influence cost of implementing this alternative.

It was estimated that it might be possible to implement the mobile unit plus one permanent facility alternative at a cost similar to costs for the other HHW collection alternatives under consideration (periodic; mobile; and five permanent facilities). Costs of all options are driven primarily by siting, waste disposal, event staffing , and capital expenditures. It was estimated that the cost per vehicle service at all four of these options would be within the $90 - $110 range. However, the unknown factors regarding facility siting and design could significantly change this estimate.

END USES (Recyclability And Redistribution Potential). The permanent facility has the potential of facilitating waste exchange

activities due to its ability to store valuable products found in the waste stream. The mobile unit has a similar redistribution potential but lacks storage capability of the permanent facility. A "high" rating was assigned to the combination alternative.

5.5 EVALUATION OF ALTERNATIVE 5 - CURBSIDE MOTOR OIL COLLECTION

The City of Cupertino sponsors curbside pick-up of used motor oil. Used motor oil is often disposed into storm sewers, drains, into the trash or onto the ground by residents who service their own cars. Therefore, motor oil collection is an effective means of reducing improper disposal of one type of HHW.

WASTE DIVERSION POTENTIAL. The City's existing curbside oil collection program serves 9,270 households and has the potential to expand to include both single and multifamily dwellings in the future. Curbside motor oil collection was rated "high" in waste diversion potential.

ABSENCE OF HAZARD. The potential exists that oil set on the curb for collection could be disturbed by children, pets, or vehicles. However, residents generally use the curbside oil collection program as directed and existing programs experience minimal problems. Curbside motor oil collection was rated "medium" for absence of hazard.

FLEXIBILITY. The curbside oil collection alternative can meet growing demand by expanding into previously unserved neighborhoods and multifamily dwellings. Curbside motor oil collection was rated "high" in flexibility.

AVAILABILITY OF SERVICE (Nearby And Frequent Service). This alternative requires no travel to a disposal event. In addition, the frequency of service can be adjusted to meet residents needs. Curbside motor oil collection was rated "high" for availability of service.

PROVIDES IMMEDIATE NEED DISPOSAL SERVICES. Curbside motor oil collection programs generally provide weekly service, thereby providing disposal services to residents preparing to move or otherwise in need of immediate disposal. A "high" rating was assigned.

LIMITED SHIFT IN WASTE TYPE GENERATION. Not applicable.

EASE OF IMPLEMENTATION. The City of Cupertino already sponsors a

curbside collection program. Therefore, this HHW management alternative was rated "high."

FACILITY NEEDS. Existing recycling trucks used for curbside collection of glass, paper, and metals also collect used motor oil. The waste oil collection tank is located at Los Altos Garbage Co. in Mountain View. This HHW management alternative was rated "high" as it does not require additional facilities.

CONSISTENCY WITH LOCAL POLICIES. Curbside motor oil collection is consistent with local and state policies that encourage HHW recycling. Effective January 1, 1991, pursuant to AB 2597, HHW collection agencies will no longer need a hazardous waste permit if materials accepted are limited to latex paint, used oil, antifreeze, spent lead-acid batteries, and nickel-cadmium, alkaline, carbon-zinc and other small batteries.

Section 25250.11(a), Health and Safety Code, exempts from its HW permit requirements "any person who receives used oil from consumers or other used oil generator," as long as no more than 20 gallons of used oil are received at a time, and containers hold no more that 5 gallons each.

Government Code Section 66798.9 (Statute, 1989) provides immunity for local agencies operating HHW programs unless the agencies act negligently. Additional immunity from state liability is provided in Health and Safety Code, Section 25366.5 for local governments or their contractors who are running HHW facilities and events. However, HHW programs would still be liable if disposal sites holding the program's HHW were declared a federal Superfund site. A "high" rating was assigned.

ABSENCE OF INSTITUTIONAL BARRIERS. Not applicable.

ESTIMATED COST. Costs for operating and expanding the curbside motor oil collection are not available at this time.

END USES (Recyclability And Redistribution Potential). Markets for used motor oil are well established. Used oil from the City is picked up by Los Altos Garbage Co. They contract with a company that re-refines the oil and then sells it for use again as a lubricating oil. Used motor oil collection received a "high" rating for recyclability.

5.6 EVALUATION OF ALTERNATIVE 6 - DOOR-TO-DOOR PICKUP FOR ELDERLY AND DISABLED RESIDENTS

A door-to-door pickup program would provide HHW services to residents unable to participate in collection events. Door-to-door pickup would be available by appointment only and the service dates could be coordinated with upcoming mobile unit or periodic events; or a permanent facility in the area. The HHW would be picked up by a registered hazardous waste hauler using licensed hazardous waste transport vehicles that comply with the Department of Transportation (DOT) regulations. HHW collected from residents homes would be transferred to a permanent HHW facility if the facility was permitted to receive such wastes; to an approved treatment, storage, or disposal (TSD) facility; or transported directly to a permitted hazardous waste disposal facility.

WASTE DIVERSION POTENTIAL. A door-to-door HHW pickup service is designed to collect wastes from individuals who may otherwise not have an opportunity to properly dispose of their HHW. This target population, the elderly and disabled unable to participate in other HHW services, represents a relatively small percentage of households in the City. A "medium" rating was assigned to this alternative for its potential to divert HHW from this small target population.

ABSENCE OF HAZARD. Proper program design, equipment, and health and safety training can minimize potential hazards associated with door-to-door HHW pickup. A "medium" rating was assigned.

FLEXIBILITY. Door-to-door collection services could be operated as an adjunct to periodic events, mobile unit or permanent facility. The service would operate on an appointment basis. The door-to-door service routing plan can be coordinated with other HHW events. A "high" rating for flexibility was assigned to this alternative as it's operation schedule and route can be readily modified.

AVAILABILITY OF SERVICE (Nearby And Frequent Service). The door-to-door HHW pickup service would require no travel for elderly or disabled residents. The frequency of service would be determined by frequency of other HHW events in the area as this service would most likely operate as an adjunct to other HHW collection services. Frequency of service is also dependent upon the level of funding available. A "medium" rating was assigned to this alternative as costs for door-to-door services may be a serious limiting factor for frequency of service.

PROVIDES IMMEDIATE NEED DISPOSAL SERVICES. The door-to-door HHW pickup service is designed to operate on an appointment-only basis

due to the cost of providing this service to a small number of residents. If the door-to-door HHW pickup service is operating as an adjunct to a permanent facility, with permanent staff, equipment, and storage space, the potential exists to provide immediate need services to elderly and disabled residents. A "medium" rating was assigned.

LIMITED SHIFT IN WASTE TYPE GENERATION. Not applicable.

EASE OF IMPLEMENTATION. If a door-to-door service operated in conjunction with a permanent facility, the permanent facility would need a variance to accept waste collected by door-to-door service. Collected HHW that was delivered to the permanent facility could be sorted and stored to enhance recycling and reuse potential. In addition, waste could be bulked to reduce disposal costs. Another method of providing door-to-door service would be to contract with a licensed hazardous waste management company which would transport collected HHW directly to a disposal facility. A "medium" rating was assigned to this alternative.

FACILITY NEEDS. Door-to-door HHW pickup services require trucks equipped to transport, handle, sort, and store hazardous materials. Space is also needed to store the collected materials unless the wastes are delivered directly to a disposal facility. It is possible that this service could be obtained on a contract basis from a licensed hazardous waste management company. A "medium" rating was assigned.

CONSISTENCY WITH LOCAL POLICIES. Door-to-door HHW collection does not appear to be incompatible with local policies. The City supports the provision of services to its residents regardless of handicap or physical limitation. A "high" rating was assigned.

ABSENCE OF INSTITUTIONAL BARRIERS. The are no existing contracts or agreements that would prevent the implementation of a door-to-door HHW pickup service for elderly and disabled residents. A "high" rating was assigned.

ESTIMATED COST. Door-to-door HHW pickup services have been sponsored by the Cities of Burbank and San Diego. In Burbank, a licensed private waste hauler collected HHW from approximately 200 elderly and disabled residents. The service was operated in conjunction with a city-sponsored HHW drop off event. The routing schedule was prepared by city staff. The collected HHW was delivered to the drop off event. The cost for this service was $8000. This cost includes only the actual collection of the HHW from the elderly and disabled residents, and does not include planning time or waste disposal costs which were included with the costs of operating the drop off event.

END USES (Recyclability And Redistribution Potential). Recyclability and redistribution potential of HHW collected in a door-to-door service would depend on whether or not the service was associated with other HHW collection programs. If collected HHW was delivered to a permanent facility, recyclable and reusable materials could be retrieved. However, if the door-to-door service was operated independent of other HHW programs, the collected wastes were delivered directly to a hazardous waste disposal facility and all wastes would be disposed. A "medium" rating was assigned to this alternative.

5.7 EVALUATION OF ALTERNATIVE 7 - HAZARDOUS WASTE EXCLUSION PROGRAM/LOAD CHECKING

The purpose of a load checking program is to detect and deter attempts to dispose of prohibited waste in landfills. It involves visual inspection for hazardous waste at the entrance to the landfill and at the working face. If prohibited waste is identified, the generator is notified and becomes responsible for removing the waste. If the generator cannot be found, the waste is removed and properly disposed. Other waste acceptance control activities include sign posting and employee training.

WASTE DIVERSION POTENTIAL. The load-checking program diverts a small amount of HHW from landfill disposal. However, load checking and the other hazardous waste exclusion programs educate generators, haulers, disposal facility personnel and the public about the proper disposal of hazardous waste. An effective hazardous waste exclusion program reduces landfill disposal of HHW in landfills, and was therefore rated "medium."

ABSENCE OF HAZARD. The potential hazards involved in a load checking program include the risk from exposure while inspecting and handling waste. Proper equipment, training and management of the load checking program can reduce hazards. Other waste acceptance control activities, such as sign posting, training, and notification of proper HHW procedures pose minimal hazards. The overall hazardous waste exclusion program alternative was rated "medium."

FLEXIBILITY. The load checking program is mandated by the state. Additional inspections and notifications could be added to strengthen existing programs. Hazardous waste exclusion activities are judged to have "medium" flexibility

AVAILABILITY OF SERVICE. Not Applicable.

PROVIDES IMMEDIATE NEED SERVICES. Not Applicable.

LIMITED SHIFT IN WASTE TYPE GENERATION. A Hazardous Waste Exclusion Program might result in a desirable shift in waste type generation. By preventing illegal landfill disposal of hazardous waste, residents may be more likely to purchase and use less hazardous substitutes.

It is possible that load checking might deter landfill disposal of hazardous waste but at the same time result in an increase in illegal disposal elsewhere. It is anticipated, however, that illegal disposal will decrease as legal disposal options become more widely available and awareness increases about environmental impacts of improper disposal. This alternative was rated "medium".

EASE OF IMPLEMENTATION. The Hazardous Waste Exclusion Program was rated "high" as it is currently in place at all landfills in the County of Santa Clara.

FACILITY NEEDS. No new facilities are needed for the load checking program. Signs have been posted at the landfills. A "high" rating was assigned to this alternative.

CONSISTENCY WITH LOCAL POLICIES

The Hazardous Waste Exclusion Program is consistent with local and state policies to keep prohibited wastes from entering the landfill. A load checking program is required in the State of California. The State Water Resources Control Board requires landfills to operate hazardous waste load checking programs (Section 2523, Title 23, California Code of Regulations (CCR)). The Department of Health Services and the California Integrated Waste Management Board require solid waste facilities to follow certain procedures regarding their load checking programs. The Department of Health Services requires a solid waste facility with a hazardous waste load checking program to obtain an identification number as a hazardous waste generator. Hazardous waste will be stored for less than 90 days in accordance with a hazardous waste permit issued by the Department of Health Services. If hazardous waste will be stored for more than 90 days, the solid waste facility must apply to the Department of Health Services for a hazardous waste facility permit or variance. Hazardous Waste Exclusion Programs were rated "high" for consistency with local policies.

ABSENCE OF INSTITUTION BARRIERS. No contractual or other institutional barriers are known that would interfere with the continuation of Hazardous Waste Exclusion Programs. A "high" rating was assigned.

ESTIMATED COST. Newby Island landfill is privately owned and includes the full cost of their Hazardous Waste Exclusion Programs in landfill tipping fees. The relatively low cost of this program is therefore properly assigned to landfill users. A "high" rating was assigned to this alternative.

END USES (Recyclability And Redistribution Potential). It is unlikely that significant amounts of HHW in good condition would be retrieved in the load checking program. Efforts by waste haulers to identify and reject HHW might encourage residents to use proper disposal methods, including recycling materials such as automotive batteries, latex paint and motor oil. Landfill sign posting and utility bill notices also encourage residents to use the city-sponsored HHW collection system that will separate a number of materials for recycling and redistribution. The Hazardous Waste Exclusion Program was rated "low" in recyclability/redistribution potential.

5.8 EVALUATION OF ALTERNATIVE 8 - HHW RECYCLING COMPONENT

A HHW Recycling Component would implement recycling procedures at all HHW collection programs. Oil, auto batteries and latex paint are currently recyclable. Solvent and antifreeze recycling may be implemented in the future.

WASTE DIVERSION POTENTIAL. Markets are already established for waste oil, auto batteries and latex paint. Strong community support exists for the concept of recycling. HHW recycling diverts wastes from both solid waste landfills and hazardous waste landfills. Therefore, the waste diversion potential of the HHW recycling component is rated "high."

ABSENCE OF HAZARD. Some hazards are associated with collection and handling of latex paint. Latex paint that has been stored for many years may contain mercury and/or lead. Older latex paint, improperly labeled paint, paint not in its original container and possibly contaminated paint should be disposed instead of recycled. Collection of used auto batteries may present hazards if batteries are cracked and leaking. Oil collection presents hazards of accidental spillage or exposure in a curbside collection program. However, recycling programs for latex paint, motor oil and auto batteries are well-established in some Santa Clara County communities and have operated safely. Proper staff training and operating procedures can reduce potential hazards. A "medium" rating was assigned.

FLEXIBILITY. As more residents use the HHW programs, additional

collection opportunities and HHW handling space might be required. This alternative was rated "high" in flexibility. Increasing amounts of recyclable materials can be accommodated without major changes in the program.

AVAILABILITY OF SERVICE. The HHW recycling component could be incorporated into mobile collection and/or the permanent facility. A "high" rating was assigned.

PROVIDES IMMEDIATE NEED SERVICE. Recyclable HHW can be accepted at a mobile unit and/or permanent facility, both of which are able to accommodate residents requesting immediate HHW disposal service. A "high" rating was assigned.

LIMITED SHIFT IN WASTE TYPE GENERATION. Not applicable.

EASE OF IMPLEMENTATION. Recycling of oil, auto batteries, and latex paint are well-established components of city-sponsored programs and will also be incorporated into the Countywide HHW Program. No obstacles are known that would hinder the continuation of existing HHW recycling programs or implementation of new recycling procedures. The HHW recycling component alternative was rated "high."

FACILITY NEEDS. A "high" rating was assigned, as no additional facilities are required to operate the recycling component of a HHW collection program.

CONSISTENCY WITH LOCAL POLICIES. The City encourages recycling of solid and hazardous waste. The County Hazardous Waste Management (Tanner) Plan ascribes to the waste management hierarchy in which recycling is the most desirable management option. In addition, state regulations encourage the collection and recycling of latex paint, used oil, antifreeze and lead-acid batteries. HHW recycling was therefore rated "high" in consistency with local policies.

ABSENCE OF INSTITUTIONAL BARRIERS. There are no known long-term contracts or franchise agreements that would interfere with recycling of HHW. A "high" rating was assigned.

ESTIMATED COST. The addition of a HHW recycling component would reduce the costs of any HHW collection and disposal system. A "high" rating was assigned to this alternative.

END USES (Recyclability And Redistribution Potential). A "high" rating was assigned, as recycling options for motor oil, automotive batteries and latex paint are well-established. Common uses of recyclable HHW include the following:

- Latex paint can be collected, sorted, consolidated, blended, repackaged, and sold or given to local public agencies and nonprofit groups. It is commonly used to cover graffiti. It can also be sent to a paint company to be re-manufactured.

- Used oil is a valuable resource. Recycling used oil saves energy and natural resources. Used oil can be refined into lubricating oil, reused as motor oil, or reprocessed and used as fuel in industrial burners and boilers. The Environmental Protection Agency estimates that only 1 gallon of used oil is needed to make 2.5 quarts of lubricating oil, compared to 42 gallons of raw crude oil.

- Lead-acid batteries - According to the CIWMB, 70 percent of spent lead-acid batteries are recycled nationwide. In California, state law requires retailers to accept trade-in of used batteries. Consumers can also delivers batteries to lead-acid battery recyclers or to HHW programs.

The average lead-acid battery contains 17.5 pounds of lead and 1.5 pounds of sulfuric acid. After the lead is separated from the non-metallic components of the battery, it is than smelted to produce soft lead and lead alloys. The non-metallic materials include sulfuric acid, which is neutralized and released into the sewer; and other non-recyclable, non-hazardous materials are disposed. (Household Hazardous Waste, Lead-Acid Batteries, CIWMB, September, 1990).

- Small Household Batteries - Recycling options for small household batteries are very limited at this time. Silver oxide button batteries may be recycled, but substantial obstacles exist to collecting and sorting these batteries. Consumer nickel cadmium battery recycling may be available in the near future. Recycling options for small household batteries are currently under study by the CIWMB. Results of this study and related research will be monitored and resulting recommendations will be considered for implementation.

- Antifreeze - Used antifreeze can be recycled for use by the mining and glycol industries. Antifreeze is sprayed on coal to inhibit sticking. Antifreeze can also be used for airplane deicing solution, cement grinding and brake fluid. (Household Hazardous Waste, Antifreeze, CIWMB, September, 1990).

5.9 EVALUATION OF ALTERNATIVE 9 - HHW WASTE EXCHANGE COMPONENT

A waste exchange program recovers valuable materials from the HHW waste stream and makes these materials available for use. The County Division of Environmental Health Services estimates that approximately 5% of incoming waste can be diverted for use. Waste exchange activities can take place at period events, mobile collection units and permanent facilities. A permanent facility allows for storage of valuable products thereby enhancing waste exchange activities.

WASTE DIVERSION POTENTIAL. Usable materials can be diverted from disposal and made available to participating residents, voluntary organizations and public agencies. A HHW waste exchange program has a "high" waste diversion potential in that a high percentage of usable materials found in the incoming waste stream could be diverted from disposal by this program.

ABSENCE OF HAZARD. Waste exchange takes place under the supervision of HHW program staff, thereby limiting hazard. However, care must be taken that outdated or contaminated products are not redistributed. In addition, residents should be required to sign a waiver of liability before accepting reusable products. Waste exchange was rated "medium" in absence of hazard.

FLEXIBILITY. A HHW waste exchange component can be implemented or eliminated depending on available space, staff, and demand. Waste exchange was rated "high" in flexibility.

AVAILABILITY OF SERVICE. The HHW waste exchange activities can be added to periodic events, mobile collection or a permanent facility. A "high" rating was assigned.

PROVIDES IMMEDIATE NEED DISPOSAL SERVICES. Not applicable.

LIMITED SHIFT IN WASTE TYPE GENERATION. Not applicable.

EASE OF IMPLEMENTATION. A HHW waste exchange component involves examination of incoming waste and segregation of usable materials for distribution to residents or public agencies. The implementation of waste exchange activities is tied to the operation of periodic, mobile, or permanent facility, all of which can implemented in the short-term planning period (before 1995). A "high" rating was assigned.

FACILITY NEEDS. No new facilities would be required to implement a HHW waste exchange component. However, the ability to store

valuable products between events at the permanent facility will increase the program's ability to redistribute valuable products. A "high" rating was assigned.

CONSISTENT WITH LOCAL POLICIES. The City supports efforts to reduce volume and toxicity of the waste stream. Waste exchange efforts were therefore rated "high."

ABSENCE OF INSTITUTIONAL BARRIERS. There are no known institutional barriers, such as contracts or franchise agreements, that would interfere with implementation of waste exchange activities as a component of HHW collection programs. A "high" rating was assigned.

ESTIMATED COST. Waste exchange activities are not expected to add to the cost of HHW collection. In fact, this alternative has the potential to reduce waste disposal costs by distributing valuable products to residents and agencies.

END USES (Recyclability And Redistribution Potential). A HHW waste exchange component was rated "high" in recyclability/redistribution potential as the purpose of this component is redistribution of usable products.

6. SELECTION OF HHW PROGRAM

6.1 ALTERNATIVE SELECTED

The selection of HHW management alternatives was based on the evaluation described above in Section 5 and summarized in Table 5.1. as well as the results of the solid waste generation study.

6.1.1 Short-Term Planning Period

The following alternatives were selected to properly manage HHW during the short-term planning period (1991-1995) in the City of Cupertino.

Alternative 4	Combination Mobile Unit Plus One Permanent Facility
Alternative 5	Curbside Motor Oil Collection
Alternative 7	Hazardous Waste Exclusion Program
Alternative 8	Household Hazardous Waste Recycling Component
Alternative 9	Household Hazardous Waste Exchange Component

Alternative 4, the combination program which includes both a mobile collection unit and one permanent facility, was selected. The mobile collection unit has the ability to provide convenient, cost-effective services to a large geographical area. The unit will operate within a 20 minute commute of most residents in participating cities. A mobile collection unit is highly flexible as both location and frequency of operation can be readily changed to accommodate variations in demand or shifts in population density. Residents requesting immediate disposal services can be accommodated at the mobile unit. The mobile unit will operate on an appointment basis. Residents arriving at the mobile unit without an appointment will be accommodated when possible. It is anticipated that the mobile unit will be operational in mid-1991.

The permanent collection facility has the ability to provide convenient, cost-effective services for a large, centralized portion of the county. The permanent facility can also meet the needs of residents throughout the county who are moving and request immediate disposal services.

A permanent facility can process participants efficiently and safely due to the presence of permanent, trained staff; proper equipment; and storage capabilities. Options for reuse and recycling of collected materials are enhanced due to space for storage. A permanent facility is flexible in that the hours of operation can increase as demand for HHW disposal services increases.

Depending on the complexity of the siting, environmental review, and permitting process, the facility operation should be operational before the end of the short-term planning period (before 1995). The planning process is already underway for the permanent facility and it is anticipated that the facility could be operational in one to two years.

Additional advantages of this alternative over the periodic events alternative are as follows. It would relieve cities of the burden of planning and staffing HHW events. Waste disposal and planning costs may be lower due to the advantage of an economy of scale for a countywide program. The combination of these two methods of HHW collection (a mobile unit plus one permanent facility) has advantages in the location and frequency of service, ease of implementation, and ability to provide immediate need service in a cost effective manner.

Alternative 5, curbside motor oil collection, was selected due to its potential to divert large quantities of one of the most prevalent types of HHW. This alternative does not require the development of a new program, rather, existing programs will be continued and expanded.

Alternative 7, the hazardous waste exclusion program, has the potential to divert incoming HHW from disposal at the landfill. This alternative can also help to educate residents and waste haulers about proper disposal of HHW. Hazardous waste exclusion programs are mandated by the state, and are already in place at all landfills in Santa Clara County.

Alternative 8, the HHW recycling component, was selected for inclusion in the permanent facility and mobile collection unit. Materials such as latex paint, motor oil and automotive batteries can be easily separated from the incoming HHW and sent for recycling instead of disposal. The recycling component has the potential of reducing the costs of the HHW collection program as there will be a reduction in the amount of HHW sent for more expensive hazardous waste disposal. Recyclable HHW materials will be sent only to permitted facilities and environmental compliance records will be maintained on file for all waste haulers and treatment, storage, and disposal companies.

Alternative 9, a HHW waste exchange component, was selected due to its ability to divert usable HHW from disposal by making it available for redistribution to residents, public agencies, and nonprofit organizations. Waste exchange activities can take place at both the mobile collection unit and the permanent facility. The HHW waste exchange component is not expected to add to program cost, and in fact, may reduce costs by reducing the amount of HHW sent for disposal.

6.1.2 Medium-Term Planning Period

The following programs were selected to manage HHW during the medium-term planning period (1995-2000)

Alternative 4 Combination Mobile Unit Plus Permanent Facility

Alternative 5 Curbside Motor Oil Collection

Alternative 7 Hazardous Waste Exclusion Program

Alternative 8 Household Hazardous Waste Recycling Component

Alternative 9 Household Hazardous Waste Exchange Component

All of the alternatives chosen for the short-term planning period will be continued into the medium-term planning period. Additional source reduction options will be explored in the medium-term planning period.

6.2 TYPES AND QUANTITIES OF HHW ANTICIPATED TO BE COLLECTED, RECYCLED, AND/OR DISPOSED

The amount of HHW to be collected, recycled or disposed from 1991 to 2000 in the City is dependent on several factors: convenience, accessibility, and efficiency of the collection services; funding available to operate the services, and the success of source reduction efforts. It is anticipated that demand for HHW services will grow as more residents become aware of proper disposal procedures and as the population of the City increases. At the same time, public education efforts should result in changes in buying habits that result in a decrease in HHW generation. Using 1990 as the baseline year, the City anticipates that implementation of the programs described in this element will result in annually increasing diversion of HHW from the municipal waste stream in the City.

Each year, the City will evaluate participation rates and demand

for services. In addition, the amount of HHW diverted and the amount of HHW remaining in the municipal waste stream will be monitored periodically by waste characterization studies. Based on these evaluations, additional HHW services may be provided as funds become available. Potential sources of additional funds include surcharges on garbage collection fees and advanced disposal fees added to product purchase prices.

At present, it is not possible to determine the amount of HHW that will be diverted by source reduction education efforts. Methods for evaluating the success of source reduction activities are currently under development. Possible methods include monitoring of changes in purchasing habits using industry marketing data; random telephone surveys; and questionnaires at collection events. Programs should not be evaluated using only self-reported data from surveys. Survey results can be easily biased by the wording of the questions, respondents' inability to recall details about past purchasing habits, and a tendency to report the desired behavior. The linguistic and cultural diversity of the community would further complicate use of survey tools to accurately measure source reduction.

The City intends to support legislative efforts, as described in the County Hazardous Waste Management (Tanner) Plan, to encourage the development of less or nonhazardous products. As such products become available to replace currently marketed products that generate HHW, it may be possible to quantify the resulting reduction in HHW generation for specific products or materials.

6.3 FACILITIES NEEDED FOR IMPLEMENTATION

The permanent facility could be a lower-cost operation utilizing roll-off bins, fencing, and spill/run-off containment structures. Other options include the use of a modified existing structure or a specially designed and constructed building. A permanent facility should have separate storage bays or bins, explosion proofing, ground columns, proper containment, sufficient ventilation and adequate emergency response and safety equipment. It should be situated on an impervious surface and be fenced for security. It is not anticipated that the City will have a permanent site within its jurisdiction due to its small land area and large percentage of developed land. A better site would be close to an existing landfill which the City does not have. The County of Santa Clara will be able to coordinate one permanent site.

6.4 HANDLING AND DISPOSAL METHODS

Handling and disposal methods are regulated by local, state and federal agencies. The mobile unit and permanent facility will be staffed by professionals trained to handle hazardous materials. Regulations will be monitored for changes and HHW programs will be modified accordingly.

Contractors who will haul and dispose of waste collected by the program must be licensed hazardous waste haulers. Environmental compliance of treatment, storage and disposal facilities will be monitored by the Santa Clara County Department of Environmental Health Services. To the maximum extent feasible, collected HHW will be diverted from disposal for recycling or reuse.

Antifreeze collected by the Countywide HHW program will be sent for fuel blending, along with the oilbased paints and solvents; or sent for recycling. Disposal method will depend upon amount of antifreeze collected and costs of disposal options.

Latex paint, automotive batteries, and motor oil will be sent for recycling. Acids and bases will be sent for incineration. Pesticides will be sent to a hazardous waste incinerator.

6.5 MULTIJURISDICTIONAL HHW EFFORTS

As described in Section 1.3, the City of Cupertino intends to participate in the Countywide HHW Program for collection services. Multijurisdictional public education programs are described in detail in Section 9. This multijurisdictional effort is expected to provide convenient, accessible, and cost-effective services for residents of the City.

Representatives from all cities and the County participated in the Household Hazardous Materials Working Group planning process which developed the countywide HHW program. The program has been reviewed and endorsed by the Solid Waste Technical Advisory Committee (TAC), the Inter-governmental Council (IGC) Solid Waste Committees, and the IGC. County departments have received the approval to administer the program from the Board of Supervisors on February 16, 1991. The Board Transmittal authorizing the program is included as Attachment 4.

Implementing the Countywide Program will promote regional cooperation and expand services available to residents of all participating jurisdictions. Providing convenient, year-round access to service on a countywide basis will maximize the amount of

HHW diverted from the municipal waste stream and meet the demands for ongoing HHW disposal services. The City expects to coordinate dates and sites for events and advertise the events within its jurisdiction.

6.6 REUSE, RECYCLING, AND END USES FOR DIVERTED MATERIALS

In 1990, 29% of the HHW collected in the City was sent for disposal and 61% was sent for recycling. This includes 16 tons of motor oil collected by the curbside program and 4.36 tons of oil, paint and automotive batteries collected at HHW events.

New recycling options may become available for materials such as oil-based paints and solvents in the future and should result in a greater percentage of HHW sent for recycling. For recycling methods for specific wastes, see Section 5.8 of this Element.

A HHW waste exchange component will be included at the mobile collection unit and permanent facility to further divert reusable materials from disposal. The material should be in its original container, and, if opened, the program staff must judge the contents to be sound and uncontaminated. The party accepting material for reuse should be required to sign a liability waiver releasing the facility operator from responsibility.

End uses for materials diverted through HHW recycling or reuse efforts were described in Chapter 5, Evaluation of HHW Management Alternatives under the "End Uses" criteria.

7. PROGRAM IMPLEMENTATION

This section describes the responsible parties, necessary tasks, estimated costs, and sources of funding for the implementation of the selected HHW program.

7.1 GOVERNMENT AGENCIES RESPONSIBLE FOR IMPLEMENTATION

The Public Works Department is responsible for oversight of the HHW management in the City. The Environmental Programs Manager will be the liaison between the City and the Countywide HHW Program and will participate in planning and evaluating the HHW collection and education activities as they pertain to the City.

The Countywide HHW Program will be implemented by the County of Santa Clara Division of Environmental Health Services and the Department of Planning and Development. The Division of Environmental Health Services will serve as the lead agency for the administration and implementation of the HHW collection program. Hazardous materials specialists and environmental health specialists will be utilized for development and initial implementation of the collection program. Health Department in-house support services including an industrial hygienist, a toxicologist, and a chemist. A public health laboratory is available. Health Department staff will contract for transportation and disposal of the HHW in compliance with federal, state, and local regulations.

The Department of Planning and Development will serve as the lead agency for public education. The Planning Department will coordinate the educational efforts with participating cities, County Environmental Health, Santa Clara Valley Water District, the wastewater treatment facilities, schools, and nonprofit agencies.

7.2 IMPLEMENTATION TASKS AND SCHEDULE FOR SHORT-TERM AND MEDIUM-TERM PLANNING PERIODS

The schedules for implementation for the selected HHW programs are included in Table 7.1. Once established, it is anticipated that these programs will continue during the short and medium-term planning periods. However, each program will undergo an annual evaluation and may be modified to meet the needs of the residents of Cupertino. The completion dates included in Table 7.1 are estimates and may be modified.

Table 7.1 Implementation Tasks And Schedules For Short And Medium-Term Planing Periods

TASK	COMPLETION DATE
Mobile Collection Unit	
▪ Formalize Interjursidictional Relationships for HHW Service	1991
▪ Select Mobile Sites	1991
▪ Obtain Permits	1991-1992
▪ Purchase Equipment and Supplies	1991
▪ Recruit and Train Staff	1991,ongoing
▪ Develop Collection Program Schedule	1991,annually
▪ Develop Record Keeping System	1991
▪ Evaluate Environmental Compliance of Contractors	1991,ongoing
▪ Contract for Waste Transportation, Recycling and Disposal Service	1991
▪ Develop and Advertise Telephone Appointment Line	1991
▪ Continue Telephone Information Line	1991
▪ Advertise Mobile Unit Schedule	1991,ongoing
▪ Conduct Mobile Collection Events	1991,ongoing
▪ Conduct Annual Evaluation of Mobile Unit Program	1992,annually
▪ Adjust Program and Service Based on Cities Desired Level of Participation and Feedback from Cities and Residents	annually
Permanent Facility	
▪ Identify Potential Sites	1991-1992
▪ Evaluate Staffing and Operational Alternatives	1991-1992
▪ Identify Permit Requirements	1991-1992
▪ Select Site	1991-1992
▪ Obtain Permits, Variances	1992-1993
▪ Develop Agreement Between County and Site Location	1992-1993
▪ Construct/Modify the Facility	1992-1993
▪ Obtain Equipment and Supplies	1992-1993
▪ Evaluate Environmental Compliance of Contractors	1992-1993
▪ Contract for Waste Transportation, Recycling, and Disposal Service	1992-1993
▪ Recruit and Train Staff	1992-1993,ongoing

- Develop Record Keeping System — 1992-1993
- Advertise Permanent Site Location and Hours — 1992-1993,ongoing
- Open Permanent Facility — 1992-1993
- Conduct Annual Evaluation of Permanent Facility — annually
- Adjust Program and Service Based on Cities Desired Level of Participation and Feedback From Cities and Residents — annually

Curbside Motor Oil Collection

The City currently sponsers a curbside oil collection program for single family dwellings. The City plans to expand this service to include multi-unit dwellings.

- Continue operation of curbside motor oil collection — 1991,ongoing
- Conduct pilot scale multiunit motor oil collection — 1991
- Implement multiunit dwelling motor oil collection — 1992

Hazardous Waste Exclusion Program

- Continue Operation of Hazardous Waste Exclusion Program — 1991, ongoing
- Include Report on Hazardous Waste Exclusion Program in Annual Evaluations — annually

HHW Recycling Component

- Evaluate Environmental Compliance Records of HHW Recycling Contractors — 1991,ongoing
- Contract for Recycling Services for Collected HHW — 1991,ongoing
- Re-evaluate and Update Recycling Options — 1991,annually

(Note: The compliance evaluations will be done by the County Division of Environmental Health Services.)

HHW Waste Exchange Component

- Include HHW Waste Exchange Procedures in Staff Training — 1991-1992, ongoing

- Develop Waiver for Residents to Sign Before Accepting Materials — 1991
- Plan for Additional Table and Storage at Mobile Unit and Permanent Facility — 1991-1992, ongoing

Monitoring and Evaluation of HHW Program

- Obtain Records from Mobile Unit and Permanent Facility Administrator — 1992, annually
- Obtain Records from Hazardous Waste Exclusion Programs — 1992, annually
- Obtain Records from City-Sponsored HHW Programs — 1992, annually
- Conduct Survey of Participating City HHW Program Administrators — 1992, annually
- Analyze Participation Data for under representation — 1992, annually
- Analyze Adequacy of Services — 1992, annually
- Write and Distribute Annual Report — 1992, annually
- Modify Programs as Necessary — 1992, annually

7.3 COST OF PROGRAMS

The City of Cupertino's estimated annual costs for 1991 for HHW programs are summarized in Table 7.2. below. Each year, the City will review its HHW services, both service provided through Countywide HHW Program as well as the City-sponsored programs such as curbside oil collection, and waste acceptance control at the landfill.

Table 7.2 Costs for Selected Programs, 1991

Program	Estimated Annual Costs	Source of Funding
Alternative 4		
Combination: Mobile Plus Permanent	** $1,000,000	All Participating Cities
City of Cupertino	*** $30,000	Resource Recovery Fund

Alternative 5	
Curbside Oil Collection	N/A
Alternative 7	
Hazardous Waste Exclusion Program	Included in landfill tipping fees
Alternative 8	
HHW Recycling	Included in $100 per vehicle cost for Combination:Permanent
Alternative 9	
HHW Waste Exchange Program	No additional cost anticipated

** The above estimate was derived by multiplying the anticipated 10,000 vehicles to be served Countywide by an estimated $100 per vehicle cost. The 10,000 vehicles figure is based on participating cities' commitment as of March 15, 1990. The $100 per car is the estimated cost for operating the pilot program in fiscal '91-'92. The $100 per vehicle cost can be estimated as follows: Labor: $24, Disposal/Hauling: $39 , Supplies, $7 Training, Advertising, Equipment and Administrative: $30.
*** This estimate is based on a commitment to collect HHW from 300 households.

7.4 SOURCES OF FUNDING FOR IMPLEMENTATION OF HHW PROGRAM

The Countywide HHW Program has several sources of funding, as described below.

- Each city participating in the program will pay for services of the Countywide program on a per-car basis.
- Funds for serving county unincorporated residents will come from garbage surcharge fees.
- The County Solid Waste Program staff may assist in preparation of annual reports.

The City's curbside oil collection will be funded by the Resource Recovery Fund.

8. MONITORING AND EVALUATION

8.1 METHODS TO QUANTIFY AND MONITOR ACHIEVEMENT OF SHORT-TERM PLANNING PERIOD OBJECTIVE

Objective #1 Provide Residents of Cupertino With Access To Convenient Household Hazardous Waste Collection Services

EVALUATION METHOD 1. Participation records will be kept at all events and programs. Results will be compiled for inclusion in annual reports.

EVALUATION METHOD 2. Analyses will be done of the geographical distribution of collection event participants. If communities or neighborhoods are found to be under-represented, the causes of the under-representation will be analyzed and appropriate steps will be taken to address this problem. This data will be included in annual reports.

EVALUATION METHOD 3. Progress on siting, permitting, and constructing a permanent HHW collection facility will be monitored by the County Health Services Administrator every 3 months to assure the project is progressing on schedule. A progress report on the development and operation of the permanent facility will be included in annual reports.

EVALUATION METHOD 4. A survey of participants will be done annually to determine level of satisfaction and identify problems. Participants will be queried regarding: ease in obtaining information about the program; length of wait for appointment; convenience of location; length of wait at collection site; the service provided by the collection event staff; convenience of operating hours.

EVALUATION METHOD 5. The amount (tonnage) of material collected by all HHW programs will be recorded. This data will be compiled and included in annual reports.

It should be noted that the total waste collected figures can be misleading for use as a program evaluation criterion. A number of factors can affect these figures, making year-to-year comparisons difficult. For example, successful source reduction efforts will reduce the amount of HHW generated per household. Furthermore, many households' first drop off is likely to be larger than subsequent drop offs because it includes the items that have been

stored for extended periods of time. Therefore, while HHW collection programs will become more accessible and efficient, the amount of HHW collected per household may actually decline over time. These effects may be particularly noticeable during the medium-term planning period (1995-2000).

Despite these limitations, the total amount collected is an important element in evaluating the success of the program. Every effort will be made to collect accurate data on amounts of HHW collected. The Countywide HHW Program's efforts to standardize HHW measurement methods will increase the accuracy of these evaluation efforts.

EVALUATION METHOD 6. The baseline waste characterization study data will be compared to subsequent waste characterization studies to evaluate the amount of HHW entering the landfill.

This type of comparison should be used with caution. In addition to the limitations described above, the percentage of the waste stream that is HHW in future waste characterization studies may not be an accurate means of evaluating the HHW program. The solid waste recycling, composting and source reduction programs will substantially reduce the overall amount of solid waste in the short-term planning period. The amount of HHW entering the landfill is expected to decline, but may not decline at the same rate as solid waste. This may result in an increase in the percentage of HHW in the solid waste stream, while the amount of HHW may actually be decreasing. Adjustments should be made to account for these factors.

Objective #2 Expand Curbside Motor Oil Collection Programs, To The Maximum Extent Possible, To Include All Single And Multi-Family Dwellings In The City Of Cupertino

EVALUATION METHOD 1. The amount of motor oil collected by the curbside collection program will be included in the annual report. The number of households eligible and number of households participating in curbside oil collection will be included.

EVALUATION METHOD 2. The City's curbside motor oil collection expansion plans and expansion progress will be included in the annual report.

Objective #3 Minimize Disposal Of Collected HHW Through Distribution Of Reusable Materials And HHW Recycling

EVALUATION METHOD 1. Each type of HHW diverted for recycling will be tracked to determine the total amount of waste recycled. The data will be included in annual reports.

EVALUATION METHOD 2. The types and amounts of HHW redistributed to nonprofit groups and public agencies will be recorded for inclusion in annual reports.

EVALUATION METHOD 3. The amount of HHW redistributed to residents at HHW events will be recorded for inclusion in annual reports.

Objective #4 - Improve Monitoring And Evaluation Of HHW Programs

EVALUATION METHOD 1. At the end of the first year of operation, the new measurement method will be evaluated by participating cities and agencies.

Objective #5 Limit Improper Disposal Of Hazardous Waste At Solid Waste Landfills By Continuing State-Mandated Hazardous Waste Exclusion Programs

EVALUATION METHOD 1. The Department of Environmental Health Services' annual reports on the hazardous waste exclusion program will be included in the annual HHW program reports.

EVALUATION METHOD 2. The quantities of HHW discovered in the load checking program will be charted in order to monitor increases or decreases from previous years.

Objective #6 Increase Efficiency And Effectiveness Of HHW Collection Services And Public Education By Coordinating Programs With Other Jurisdictions And Agencies Whenever Feasible

EVALUATION METHOD 1. Annual surveys of participating city officials will be done to determine overall level of satisfaction and to identify problems in the collection and public education programs.

EVALUATION METHOD 2. Annual surveys of agencies and organizations involved in the countywide HHW program will be done to assess satisfaction with the cooperative HHW collection and public education efforts.

Objective #7 Decrease Potential Short and Long-Term Liability Risks By Monitoring Environmental Compliance Records And Proof Of Insurance Of Contract Waste Haulers And Contract Treatment, Storage And Disposal Facilities

EVALUATION METHOD 1. An environmental compliance file will be maintained for each hazardous waste management and recycling firm utilized by the program. The file will be reviewed and updated annually to include environmental compliance records, results of on-site audits; and proof of liability insurance. A summary of these activities will be included in the annual reports.

Objective #8 Increase Source Reduction Options For Residents By Supporting Legislative Efforts Aimed At Development Of Safer Products And Safer HHW Management Methods

EVALUATION METHOD 1. The annual HHW management report will include a summary of legislative efforts sponsored or endorsed by participating cities and the County for the unincorporated area.

8.2 METHODS TO QUANTIFY AND MONITOR ACHIEVEMENT OF MEDIUM-TERM PLANNING PERIOD OBJECTIVES

Objective #1 Continue The Objectives Developed For The Short-Term Planning Period Into The Medium-Term Planning Period

EVALUATION METHOD 1. The evaluation methods described above for the short-term planning period objectives will be continued into the medium-term planning period.

Objective #2 Increase Source Reduction Efforts

EVALUATION METHOD 1. At the beginning of the medium-term planning period, additional strategies for promoting source reduction will be considered.

8.3 WRITTEN CRITERIA FOR EVALUATING PROGRAM'S EFFECTIVENESS

The County HHW Program will prepare bi-annual reports describing the findings of the evaluation outlined above. Also included in

the reports will be city-specific data for each jurisdiction participating in the program. For each city, the total amount of HHW diverted; amount recycled; number of residents utilizing the programs; amount recycled; and cost per ton, yard, or drum to divert HHW; will be included. When future waste characterization studies are done, the amount of HHW remaining in the waste stream will be included.

Additional information describing the markets for recyclable HHW materials will be included in the annual report. The markets for recyclable materials will be monitored to determine if additional markets are necessary or if additional materials can be sent for recycling.

The bi-annual report will also include an overall evaluation of the adequacy of the HHW collection services. Increases in demand for services and increases in population will warrant adjustments in the operating schedule of the mobile collection unit and the permanent facility. In addition, underutilization in specific communities or neighborhoods will be examined and addressed.

8.4 RESPONSIBLE PARTIES FOR MONITORING, EVALUATION, AND REPORTING

The City of Cupertino's Public Works Department, the Santa Clara County Solid Waste Program, the County Department of Environmental Health Services will monitor and evaluate the HHW Program described above. In the City of Cupertino, the Public Works Department will participate in the countywide HHW planning, implementation, monitoring, and reporting activities. The County Solid Waste Program intends to assist in preparation of bi-annual reports on the Countywide HHW program. The Department of Environmental Health Services will implement and monitor the mobile and permanent facility collection activities as well as the landfill load checking programs.

8.5 FUNDING REQUIREMENTS FOR MONITORING AND EVALUATION

Monitoring and evaluation of HHW management in the City will be by the Public Works Department Environmental Programs Manager. The County Solid Waste Program budget includes funding for administrative activities such as recordkeeping, monitoring recyclable materials markets, tracking the demographics of participants utilizing the program, and bi-annual report-writing. The County Environmental Health Department's HHW and landfill load

checking programs included recording keeping and reporting procedures.

8.6 CONTINGENCY MEASURES

If the programs described above fail to meet the goal of diverting HHW from landfill disposal, the following tasks can be implemented:

- Analyze existing programs for obstacles to successful implementation
- Increase or improve education and advertising efforts
- Increase the number of sites for the mobile collection unit
- Increase the hours of operation at the permanent facility and mobile collection unit
- Increase funding and staff
- Modify objectives
- Revise the implementation schedule for permanent facility
- Increase enforcement efforts
- Increase penalties for improper disposal

9. EDUCATION AND PUBLIC INFORMATION

9.1 OBJECTIVES FOR SHORT AND MEDIUM TERM PLANNING PERIOD

Objective #1 Increase Residents' Awareness Of Source Reduction, Safer Use And Proper Disposal Of HHW

MULTIJURISDICTIONAL EDUCATION AND PUBLIC INFORMATION PROGRAM. The City will participate in public education programs which will be coordinated by the Countywide HHW Program. The Countywide HHW Program will coordinate public education efforts with the Nonpoint Source Pollution Control Program, the wastewater treatment plants' source reduction programs, the school science education curriculums, and nonprofit educational organizations.

CITY PUBLIC EDUCATION AND INFORMATION PROGRAMS. The City will provide information to residents regarding the City-sponsored curbside motor oil collection.

SOURCE REDUCTION. Residents will be informed of the availability of less or non-hazardous substitutes. The need for public support for development of products which do not result in the generation of household hazardous waste will be included in public education materials.

PROPER USE AND STORAGE. Residents will be informed about the hazardous nature of some products and methods for proper use and storage of such products.

PROPER DISPOSAL. Residents will be informed of the environmental hazards associated with improper disposal of HHW, and will receive guidance on proper disposal methods.

Objective #2 Increase The Accuracy And Uniformity Of HHW Source Reduction And Disposal Public Information Disseminated By Public Agencies

TRAINING FOR USE OF GUIDEBOOK. Employees of public agencies and organizations in Santa Clara County who respond to public inquiries regarding HHW will be eligible to participate in training on the use of the "Guidebook for Proper Management of Household Waste for the Protection of Our Local Environment". The Guidebook will be

distributed to approximately 250 agencies and organizations in the Spring of 1991.

GUIDEBOOK UPDATES. The County Hazardous Waste Planning staff will oversee updates/supplements of the manual as necessary.

9.2 EXISTING EDUCATION AND PUBLIC INFORMATION PROGRAMS

City-sponsored Education Efforts

The City has sponsored educational efforts to inform residents of proper disposal methods of HHW. In addition, residents have received guidance on how to generate less hazardous waste by using less and nonhazardous alternatives. These efforts include:

- Publication and distribution of the "Take Me Shopping-A Consumer Guide To Safer Alternatives For Household Hazardous Products". Approximately 500 copies were presented by the City to residents in 1990.

- Phone inquiries from residents regarding HHW disposal and alternative products are answered by City staff.

- Advertising was done in preparation for upcoming collection events. The following methods were used:

  Articles in City newsletter.
  Messages in utility bills.
  Advertisements in local newspapers.

Non-profit and Volunteer Organization Efforts

LEAGUE OF WOMEN VOTERS. In 1990, the League of Women Voters sponsored the production and distribution of a video entitled "Cleaning Up Toxics at Home." The League distributed copies of the video to 16 libraries, 15 city governments, the County Hazardous Waste Management Program, 7 junior colleges, 3 universities, and 8 perinatal education groups in Santa Clara County.

The League also printed and distributed 4000 copies of "Take Me Shopping", as well as a flyer entitled "Cleaning Up Toxics", in 1990.

Public Agency-Sponsored Programs with Participation of The City of Cupertino

NONPOINT SOURCE POLLUTION CONTROL PROGRAM. In 1987, the City joined the Nonpoint Source Pollution Control Program, a project of the Santa Clara Valley Water District. Nonpoint source water pollution refers to pollutants which run-off from a broad area of land rather than enter the water through a discrete pipe or conduit. The purpose of the Nonpoint Source Program is to reduce stormwater-borne pollutants entering the southern San Francisco Bay. Specific pollutants of concern, in order of priority, are heavy metals (cadmium, copper, lead, mercury, nickel, silver and selenium); hydrocarbons (contained in oil and grease): pesticides and herbicides; suspended sediments; and organic pollutants.

The Nonpoint Source Program Public Information/Participation Plan aims to inform the pubic about the causes and origins of nonpoint source pollution, explain the correct practices for controlling pollutants at their source, and involve the active support of the public in implementing these practices. The Nonpoint Source Program aims to reduce improper disposal of HHW into nonpoint pathways and at the same time discourage disposal of HHW into the solid wastestream.

In 1991, the Nonpoint Source Program began its public educational efforts with publication of a brochure entitled "The Bay Begins at Your Front Door!" The brochure explains how residents can prevent pollution of the San Francisco Bay by keeping hazardous materials from entering the storm drain system. The Nonpoint Source Control Program plans to distribute this brochure and several pollutant specific brochures focussing on motor oil and pesticides. Additional educational programs are under development.

WASTEWATER TREATMENT PLANTS. The San Jose/Santa Clara Water Pollution Control Plant serves the Cities of San Jose, Santa Clara, and Milpitas; the Cupertino Sanitary District, County Sanitation District No. 2-3, and the West Valley Sanitation District serving the Cities of Campbell, Los Gatos, Monte Sereno and Saratoga; and the Sunol Sanitary District and the Burbank Sanitary District in the unincorporated area. The plant sponsors a public education effort aimed at reducing the discharge of hazardous wastes into the sanitary sewer system. Residents are informed of proper disposal methods for hazardous materials and urged to use the HHW collection days for household-generated wastes.

SANTA CLARA COUNTY OFFICE OF EDUCATION. The County Office of Education oversees the implementation of the State Department of Education's mandated Science Framework in the 37 school districts in Santa Clara County. A revised science curriculum is being phased into the schools in 1990 and 1991 and contains lessons on hazardous materials for grades K-12.

SANTA CLARA COUNTY HAZARDOUS WASTE MANAGEMENT PLAN (Tanner Plan). The Santa Clara County Tanner Committee developed the following three public education policies for management of HHW. The Plan was formally approved by the City and will be adopted by the City upon approval of the Plan by the State Department of Health Services.

Public Education Policy #1

> "The County and Cities shall coordinate the development of a program for the proper management and disposal of household hazardous waste on a countywide basis in accordance with the waste management hierarchy and considering existing programs and conditions."

This policy resulted in the formation of the Household Hazardous Materials Working Group. The Working Group is composed of representatives from each of the cities; County hazardous waste, solid waste and environmental health staff; private solid waste contractors; and community advisory members. The Working Group conducted a thorough evaluation of HHW management alternatives. This evaluation resulted in a decision to implement a pilot countywide HHW collection and public education program in fiscal year 1991-1992. The evaluation of HHW management alternatives and a description of the selected program are included in this document.

Public Education Policy #2

> "The County, in coordination with the Cities, shall initiate a public education campaign which will inform all county residents about the potential hazards associated with household products, how to dispose of them safely, and safe substitute products and practices that can be used in place of hazardous substances."

Several educational publications have been produced: "Take Me Shopping - A Consumer Guide To Safer Alternatives For Household Hazardous Products" and "The Guidebook for Proper Management of Hazardous Wastes". Additional Countywide educational activities are currently under development and are described in detail in this document.

Public Education Policy #3

> "The County, in coordination with the Cities and industry, shall engage in direct public education concerning hazardous waste reduction and management such as workshops, utilization of the media, school programs, and information dissemination."

As a result of this policy, industry-specific waste minimization workshops have been held in the county. Workshops for the metal finishing industry and the automotive service industry provided up-to-date waste minimization and regulatory compliance information to over 500 local businesses as of March 15, 1991. In addition, one jurisdiction is working with its local industry in developing a pilot educational program to provide waste minimization information to all types of hazardous waste generators. Business and industry associations are also participating in these efforts. In addition, an effort to coordinate hazardous waste public education programs with local schools is underway, and includes the participation of several local community colleges.

9.3 IMPLEMENTATION OF EDUCATION AND PUBLIC INFORMATION PROGRAM IN THE SHORT AND MEDIUM-TERM PLANNING PERIODS

9.3.1 Program Description

COUNTYWIDE EFFORTS. The City plans to participate in the educational efforts coordinated by the Countywide HHW Program. Residents will be informed about how to use, store, and dispose of household hazardous waste properly. An aggressive source reduction component will be included to promote less hazardous alternatives and thereby reduce generation of HHW.

The Countywide HHW Program will coordinate educational efforts with participating cities, nonprofit organizations, and public agencies such as the Nonpoint Source Control Program, wastewater treatment plants, and local schools.

CITY EFFORTS. The public education efforts currently underway in the City are described above under "Existing Conditions". It is anticipated that these city-sponsored programs will be continued into the short and medium-term planning periods. A summary of public education activities to be carried out in the short and medium-term planning period follows.

- HHW information telephone line
- Printing and Distribution of "Take Me Shopping" at HHW

events and upon request
- Use of "The Guidebook for Proper Management of Hazardous Wastes"
- Advertising in local papers and on the radio, public service announcements
- Non-Point Source Public Education brochures

9.3.2 Agencies Responsible For Implementation Of Education And Public Information Program

The Public Works Department is responsible for oversight of the HHW education and public information programs in the City. The Environmental Programs Manager will be the liaison between the City and the Countywide HHW Program and will participate in education and public information activities as they pertain to the city.

The County Department of Planning and Development will serve as the lead agency for public education. The Planning Department will coordinate the educational efforts with participating cities, County Environmental Health, Santa Clara Valley Water District, the wastewater treatment facilities, schools, and nonprofit agencies.

9.3.3 Implementation Tasks

Public Education

▪ Develop and Distribute Event Advertising Notices	1991, ongoing
▪ Develop and Distribute "The Guidebook" to Public Agencies	1991
▪ Provide Training for Staff Using the Guidebook	1991-1992
▪ Reproduce and Distribute the "Take Me Shopping" booklet	1991, ongoing
▪ Continue City HHW Telephone Information Line	1991, ongoing
▪ Participate in Ongoing Multiagency HHW Public Education Efforts	1991, ongoing
▪ Develop and Disseminate Source Reduction and Product-Specific Information Messages	1991, ongoing

9.3.4 Costs And Sources Of Funding For Implementation Of Education And Public Information Programs

PUBLIC INFORMATION. Each city participating in the Countywide HHW Program will pay for services on a per-vehicle basis. The cost of publicizing the mobile and permanent facility services was included in the $90 to $100 per vehicle cost. Funds for serving county unincorporated residents will come from garbage surcharge fees.

EDUCATION. The budget for implementing education programs is currently under development. The Countywide HHW Program is coordinating its educational efforts with participating cities, public agencies, and nonprofit organizations. The City's costs for public education have not been determined because the program is still under development. Future costs will be funded through the Resource Recovery Fund.

9.4 MONITORING AND EVALUATION

9.4.1 Evaluation Methods

The methods described below will be used to measure achievement of the education and public information objectives.

Objective #1 - Increase Residents' Awareness Of Source Reduction, Safer Use, And Proper Disposal Of HHW

EVALUATION METHOD 1. Annual surveys of residents will be done to determine the extent to which buying habits have changed to reduce generation of HHW; and the percent of residents aware of safe use and disposal practices. Results of the surveys will be included in the annual reports.

Objective #2 - Increase The Accuracy And Uniformity of HHW Source Reduction And Disposal Public Information Disseminated By Public Agencies

EVALUATION METHOD 1. Annual surveys of public and nonprofit agencies using the "Guidebook for Proper Management of Household Waste for the Protection of Our Local Environment" will be done to determine level of satisfaction and need for changes.

EVALUATION METHOD 2. Periodic updates of the Guidebook will be done to accommodate changes in HHW management.

9.4.2 Written Criteria For Evaluating Program Effectiveness

The County HHW Program, in conjunction with the City will prepare annual reports describing the findings of the evaluation outlined above. Education and public information programs will be evaluated to determine changes in purchasing habits, level of awareness of proper use and disposal, level and distribution of participation, and changes in availability of less hazardous products. Criteria for evaluating the Guidebook include level of satisfaction among users and a determination regarding the need for revision.

9.4.3 Agencies Responsible For Monitoring, Evaluation And Reporting

The agencies responsible for monitoring, evaluation and reporting include the Public Works Department of the City, the County Division of Environmental Health Services, and the County Department of Planning and Development.

9.4.4 Funding Requirements And Sources For Monitoring And Evaluation

Monitoring and evaluation of HHW management in the City will be funded through the Resource Recovery Fund in the Public Works Department. The County Solid Waste Program budget includes funding for administrative activities such as recordkeeping, monitoring recyclable materials markets, tracking the demographics of participants utilizing the program, and annual report writing. The County Environmental Health Department's HHW include record keeping and reporting procedures.

9.4.5 Contingency Measures

In the event that the annual evaluations indicate a shortfall in attainment of the education and public information objectives, the following measures may be implemented.

- Analyze existing programs for obstacles to successful implementation
- Increase or improve education and advertising efforts
- Increase funding and staff
- Modify objectives
- Increase frequency of program monitoring and review

9.4.6 Program Monitoring And Reporting Schedule

Annual reports will be written and distributed at the end of each 12 months of operation. It is anticipated that the first annual report will be written in October, 1992.

10. FUNDING

10.1 PROGRAM COSTS AND ALLOCATION OF RESOURCES

The City must demonstrate that there is sufficient funding and allocation of resources for program planning and development and implementation of required programs.

Cost estimates for programs scheduled for implementation, as well as revenue sources to support these programs, are contained in Table 7.2 in Section 7 of this element. In addition, more detailed descriptions of estimated program costs are contained in Section 5, Evaluation of Household Hazardous Waste Management Alternatives.

10.2 CONTINGENCY FUNDING

In the event that adequate funding is not available from the revenue sources identified in Table 7.2, the City may consider new or additional garbage surcharge fees.

permit or operated a hazardous waste facility under interim status pursuant to Section 25200 or 25200.5 since January 1, 1984.
(Added by Stats. 1989, Ch. 1257.)

25113. (a) "Disposal" means either of the following:
(1) The discharge, deposit, injection, dumping, spilling, leaking, or placing of any waste so that the waste or any constituent of the waste is or may be emitted into the air or discharged into or on any land or waters, including groundwaters, or may otherwise enter the environment.
(2) The abandonment of any waste.
(b) The amendment of the section made at the 1989-90 Regular Session of the Legislature does not constitute a change in, but is declaratory of, the existing law.
(Amended by Stats. 1989, Ch. 1436.)

25114. "Disposal site" means the location where any final deposition of hazardous waste occurs.
(Amended by Stats. 1977, Ch. 1039.)

25115. "Extremely hazardous waste" means any hazardous waste or mixture of hazardous wastes which, if human exposure should occur, may likely result in death, disabling personal injury or serious illness caused by the hazardous waste or mixture of hazardous wastes because of its quantity, concentration, or chemical characteristics.
(Amended by Stats. 1977, Ch. 1039.)

25115.1. "Federal act" means the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. Sec. 6901 et seq.).
(Added by Stats. 1988, Ch. 1061.)

25116. "Handling" means the transporting or transferring from one place to another, or pumping, processing, storing, or packaging of hazardous waste, but does not include the handling of any substance before it becomes a waste.
(Amended by Stats. 1980, Ch. 878.)

25116.5. (Repealed by Stats. 1986, Ch. 1187.)

25117. (a) "Hazardous waste" means either of the following:
(1) A waste, or combination of wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may either:
(A) Cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness.
(B) Pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported, or disposed of, or otherwise managed.
(2) A waste which meets any of the criteria for the identification of a hazardous waste adopted by the department pursuant to Section 25141.
(b) "Hazardous waste" includes, but is not limited to, RCRA hazardous waste.

Attachment 2 CIWMB Form 303

State of California — California Integrated Waste Management Board

HOUSEHOLD HAZARDOUS WASTE COLLECTION INFORMATION

CIWMB-303 (1/90)

Name of Local Agency: CITY OF CUPERTINO — Phone: (408) 252-4505

Address:	City:	County:	State:	Zip:
10300 TORRE AVE.	CUPERTINO, CA	SANTA CLARA,	CA	95014

(Please Use Applicable Units of Measurement)

Waste Category	Gallons	Pounds	Number of Containers	Number of Drums (55 gal)	Management Method
A. Flammable					
1. Used Oil	278				RC
2. Paints					
a. Latex	388				RC
b. Oil Base	1,243				D
3. Solvents, thinners, and stains	821				T-1, D
4. Gasoline and oil (mixed)					
5. Aerosols (excluding pesticides/ herbicides)		1,302			D
6. Other (antifreeze)	68				RC
FLAMMABLE SUBTOTAL	2,798	1,302			

Management Methods

Ru	Re-used	Tr	Transfer Station	T-3	Stabilization
Rc	Recycled	T-1	Incinerator	D	Land Disposal
Bf	Blended Fuel	T-2	Aqueous Treatment		Other

Waste Category	Gallons	Pounds	Number of Containers	Number of Drums (55 gal)	Management Method
B. Pesticides					
Such as herbicides, insecticides, fungicides, etc.	200	930			T-1,D
PESTICIDE SUBTOTAL	200	930			
C. Corrosives					
1. Acids a. Oxidizing	58				T-1,D
b. Non-Oxidizing					
2. Alkaline	60				T-1,D
CORROSIVES SUBTOTAL	118				
D. Oxidizers					
Excluding acids	6	372			T-1,D
OXIDIZERS SUBTOTAL	6	372			
E. Miscellaneous					
1. Car Batteries			83 EA		RC
2. Dry Cells					
3. Mercury					
4. Other	333	651			D
MISC. SUBTOTAL	333	651	83		
TOTAL WASTE COLLECTED	3,455	3,255	83		

Table 5.1 Evaluation of Household Hazardous Waste Management Alternatives

Attachment 3

	Alt. 1 Periodic Drop-Off Events	Alt. 2 Five Permanent Facilities	Alt. 3 Mobile Collection	Alt. 4 Mobile Unit + Permanent	Alt. 5 Curbside Motor Oil Collection	Alt. 6 Door-to Door Eld./ Disabled	Alt. 7 HW Exclusion Program	Alt. 8 HHW Recycling Component	Alt.9 Waste Exchange Component
Waste Diversion Potential	Low	High	High	High	High	Medium	Medium	High	High
Absence of Hazard	Medium	High	Medium	High/Med.	Medium	Medium	Medium	Medium	Medium
Flexibility	Medium	High	High	High	High	High	Medium	High	High
Availability of Service	Medium	High	High	High	High	Medium	N/A	High	High
Provides Immediate Needs Svcs.	Low	High	High	High	High	Medium	N/A	High	N/A
Limited Shift in Waste Type Production	N/A	N/A	N/A	N/A	N/A	N/A	Medium	N/A	N/A
Ease of Imple-mentation	High	Medium	High	High	High	Medium	High	High	High
Facility Needs	High	Low	High	Medium	High	Medium	High	High	High
Consistent With Local Policies	Medium	Medium	High	Medium	High	High	High	High	High
Absence of Institutional Barriers	High	High	High	High	N/A	High	High	High	High
Estimated Cost	$90-100 per car	$90-100 per car	$90-100 per car	$90-100 per car	N/A	$40 per household	N/A	N/A	$0
End Uses	Medium	High	Medium	High	High	Medium	Low	High	High

Note: N/A=Not Applicable

County of Santa Clara
Health Department

2220 Moorpark Avenue
San Jose, California 95128

RECEIVED
FEB 11 1991
COUNTY OF SANTA CLARA
OFFICE OF TOXICS AND SOLID WASTE
MANAGEMENT

Prepared by: Isao Kobashi (16)
Erwin Koehler

Reviewed by: Lee Esquibel
Delia B. Alvarez

Submitted by: J. Kennedy Bartholet

February 7, 1991

TO: Sally Reed, County Executive

FROM: J. Kennedy Bartholet, Health Services Administrator

SUBJECT: Countywide Household Hazardous Waste Collection Program

RECOMMENDED ACTION

It is recommended that the Board of Supervisors:

Approve the concept of a Countywide Household Hazardous Waste Collection Program, including provision of services to unincorporated residents.

Authorize the County Division of Environmental Health Services to administer a Countywide Household Hazardous Waste (HHW) Pilot Collection Program for the first year of operations and to administer any on-going Program resulting from the Pilot Countywide HHW Program.

FISCAL IMPLICATIONS

- No monies from the County General Fund would be required.
- Participating cities would pay their proportional share of Program costs based on the services provided to their residents.
- Funds for serving county unincorporated residents would come from garbage surcharge fees.

Board of Supervisors: Susanne Wilson, Zoe Lofgren, Ron Gonzales, Rod Diridon, Dianne McKenna
County Executive: Sally R. Reed

ATTACHMENT 5
MOU BETWEEN COUNTY AND CITY OF CUPERTINO

RESOLUTION NO. 8530

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CUPERTINO AUTHORIZING EXECUTION OF "AGENCY AGREEMENT FOR COUNTYWIDE HOUSEHOLD HAZARDOUS WASTE COLLECTION PROGRAM" WITH THE COUNTY OF SANTA CLARA

WHEREAS, there has been presented to the City Council an "Agency Agreement for Countywide Household Hazardous Waste Collection Program"; and

WHEREAS, said agreement provides for the collection of household hazardous waste as a cooperative effort with the County of Santa Clara; and

WHEREAS, the terms, conditions, and provisions of the agreement have been reviewed and approved by the City Attorney and the Director of Public Works.

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Cupertino hereby approves the aforementioned agreement and authorizes the Mayor and the City Clerk to execute said agreement on behalf of the City of Cupertino.

PASSED AND ADOPTED at a regular meeting of the City Council of the City of Cupertino this 21st day of October, 1991 by the following vote:

Vote	Members of the City Council
AYES:	Goldman, Rogers, Sorensen, Szabo, Koppel
NOES:	None
ABSENT:	None
ABSTAIN:	None

ATTEST:

/s/ Dorothy Cornelius
City Clerk

APPROVED:

/s/ Barb Koppel
Mayor, City of Cupertino

AGENCY AGREEMENT FOR COUNTYWIDE HOUSEHOLD HAZARDOUS WASTE COLLECTION PROGRAM

This Agreement is made by and between the City of Cupertino (City) and County of Santa Clara (County) on the _____ day of _____, 1991.

RECITALS

A. The County Board of Supervisors has approved a one year pilot Countywide Household Hazardous Waste Collection Program whereby residents of the county and participating jurisdictions will have an opportunity to safely dispose of household hazardous wastes on an appointment or emergency basis regardless of the specific location at which an event has been scheduled.

B. The participating jurisdictions desire to provide residents with convenient opportunities to safely dispose of their household hazardous waste in order to encourage the proper disposal of toxic products and avoid unauthorized or improper disposal in the garbage, sanitary sewer, storm drain system, or on the ground, in a manner which creates a health or environmental hazard.

C. The participating jurisdictions desire to provide a safe, convenient, and economical means for the residents of City of Cupertino, and residents of unincorporated County areas to dispose of household hazardous wastes. These wastes include, but are not limited to, common household products such as household cleaning products, spot remover, furniture polish, solvents, oven cleaner, insecticides, oil base paints, motor oil, antifreeze and car batteries. Residents of the areas listed above will be eligible to bring household hazardous wastes to a household hazardous waste collection event where these wastes will be accepted for proper disposal as described below.

D. The participating jurisdictions desire to schedule Household Hazardous Waste Collection Events during fiscal year 91-92.

NOW, THEREFORE, CITY OF CUPERTINO and COUNTY OF SANTA CLARA AGREE AS FOLLOWS:

1. PURPOSE

The purpose of this Agreement is to state the terms and conditions under which each of the jurisdictions will participate in the Household Hazardous Waste Collection Program (Program) available to the residents of the City of Cupertino, residents of County unincorporated areas, and residents of other participating jurisdictions.

2. SERVICES PROVIDED BY COUNTY

The County shall conduct Household Hazardous Waste Collection Events (Events) at various sites located in Santa Clara County. The County shall obtain all necessary permits and licenses and shall provide or secure the services of properly trained personnel, hazardous waste haulers, equipment, and supplies to properly receive, package, label, haul, recycle and dispose of the residential hazardous wastes collected at Events. Insurance requirements for transporters and hazardous waste treatment or disposal services shall have the following minimum limits: General Comprehensive--$1 million per occurrence, $2 million aggregate; Auto--$1 million; workers comp.--statutory limits established by law; and environmental impairment liability --$1 million per occurrence, $2 million aggregate. Other services to be provided by the County include establishing and operating a telephone hotline to schedule appointments for the Events and to provide information about household hazardous materials. The telephone hotline shall be operated 5 days a week, Monday through Friday, from the hours of 8:30 a.m. to 4:30 p.m., excluding holidays.

County intends to schedule Events during four collection periods as indicated in Attachment A, "Preliminary Schedule For Mobile HHW Collection Events".

3. ROLE OF CITY

A. Scheduling: The City shall work with the County to determine the date(s) of the Events. Although every effort will be made to accommodate City requests to schedule an Event on specified dates, County shall determine the final dates if there are conflicting requests from Cities participating in the Program.

B. Site Selection: The City shall coordinate with the County in locating and securing sites for the Events. It is recognized that

some of the cities participating in the Program may not have appropriate sites available.

4. WASTES NOT ACCEPTED

Certain hazardous waste materials shall not be accepted for collection and disposal. These include compressed gas cylinders, radioactive materials, and explosives. Other wastes not accepted are wastes produced in the course of operating a business, including a business operated out of a house.

5. TRACKING OF WASTES ACCEPTED

Following each collection period, the County will provide a report to the City regarding the types and quantities of Household Hazardous Waste accepted by the Program. The report will include the amount of waste diverted for reuse or recycling, the waste management method for each waste stream and associated costs for transportation and disposal.

It will be assumed for billing and reporting purposes that each city is contributing to the waste stream proportional to the number of residents served. The County will sample the types and quantities of waste contributed by residents of each jurisdiction to study the equity of sharing program costs based on an average per vehicle fee. A report on the results of the sampling will be provided to each city as part of a final Program report.

6. ADVERTISING/PUBLIC INFORMATION

The parties shall cooperate to inform the public of the Program and schedule. Each party shall be primarily responsible for advertising the availability of the Program within its jurisdiction.

7. COLLECTION APPOINTMENT SYSTEM

A. Scheduling Options: The County shall establish a "Hotline" to schedule appointments for Events. Three options are available for scheduling:

1. All applicants screened by city representatives prior to scheduling a Program appointment;

2. Allotted appointment evenly distributed throughout the year and County makes all appointments;

3. Appointment scheduled as residents call "Hotline", City notified when indicated participation limit is approached.

City elects option 3 as its choice in utilizing the "Hotline" services for scheduling appointments.

B. Reservation of Appointments for City residents: Each city or combination of cities that have previously sponsored household hazardous waste collection events shall have 75% of the planned appointments reserved for residents of the area in which the Event is scheduled. The appointments will be reserved by the County for up to three (3) weeks before the Event. After this time all remaining appointments may be filled by residents of other jurisdictions.

8. CITY FUNDING COMMITMENT

City agrees to commit up to $ 30,000 ( ) to the Program during FY91-92 to enable the County to serve 3,000 households from City at an average cost of $100 per car.

9. COST OF PROGRAM

A. Start-Up Costs: Start Up Costs are defined as the cost of equipment purchases needed to begin the Program. Start-Up Costs to each of the participating jurisdictions shall be a one time fee of $.025 per-household within its jurisdiction. For non-census years, household population shall be determined by the State Department of Finance, Demographic Research Unit. Any city that joins the Program after the first year shall be required to pay a start-up cost of $.025 (annually adjusted for inflation) per household within the city. The Start-Up cost per household shall be adjusted as of July 1, 1992 and annually thereafter to reflect changes in the San Francisco-Oakland-San Jose Metropolitan Area Consumer Price Index (All Urban Consumers; 1982-84 = 100) compiled and published by the United States Department of Labor, Bureau of Labor Statistics.

City Start-Up Costs are $ 360.00 .

B. Event Costs (permits, licenses, service and supplies, transportation and disposal): The Event Costs shall be initially set at a flat per vehicle fee of $100 per household that shows up at an event regardless of the quantity, volume, quality, or character of the hazardous waste collected from a resident, within the limits set forth herein. The Program will accept household hazardous wastes, within the limits set forth herein, from households who come to an

event without an appointment. The jurisdiction from which the households who come to an event without an appointment will be charged the same per vehicle rate as regular appointments.

C. Actual Average Cost: The County will provide City with interim cost reports following each collection period (October-December, January-February, March-April, May-June). If the interim cost reports show Event Costs are greater than projected, future Event Costs shall be adjusted to reflect this higher cost and fewer households will be served or City may elect to increase it financial commitment to the Program. If costs are less than projected, the City may elect to receive credit for a continuing program or a refund after final program costs have been computed. At the end of the fiscal year, actual costs of providing service will be used to calculate the final average per vehicle cost.

10. PAYMENT TO COUNTY

The City shall pay County for Start-up Costs and Event Costs as follows:

A. Start-Up Costs: County will compute each participating city's Start-Up Costs. Start-Up Costs are due within 30 days from the date of this Agreement.

B. Event Costs: Payments for Event Costs are due in four (4) equal installments. Each jurisdiction will be billed 25% of its total financial commitment to the Program as identified in Paragraph 8 (A) of this document. Payment for the first collection period is due within 30 days from the date of this Agreement. The County will invoice the City 30 days before each of the subsequent collection periods. Payment for subsequent collection periods will be due on January 1, 1992, March 1, 1992, and May 1, 1992.

11. ACCOUNTING

The County shall employ means to verify the place of residence of all participants in the Program and provide a record to the City of its participating residents within two weeks following the collection period.

12. TERM OF AGREEMENT

This Agreement shall be effective upon signing by both City and County and shall remain in full force and effect until terminated by any party hereto upon thirty (30) days written notice to each of the other parties or until midnight June 30, 1992, whichever comes

first. This Agreement may be extended from year to year upon written agreement of County and City.

13. HOLD HARMLESS AND INDEMNIFICATION

County shall indemnify, hold harmless, and defend City, its officers, agents, and employees with respect to any loss, damage, liability, cost or expenses, including attorney's fees, arising from failure to comply with any provision of this Agreement by County and/or its subcontractors or arising from performance of any of the work or providing any of the services under this Agreement, including negligent acts, except as required by the special provisions in the following paragraph.

City shall indemnify County for its apportioned share of any liability incurred and attributed to the Program for the transportation, treatment, or disposal of the household hazardous waste, once the waste has been accepted by a licensed hazardous waste hauler. Apportionment for disposal liability shall be determined by the City's pro rata proportion of household participation in the Program. Apportionment for transportation and treatment liability shall be determined by the City's pro rata household participation at the event where the waste was generated. Unless there is no primarily responsible party, no liability shall be apportioned to the City unless the resources (including insurance) of any primary responsible hauler or responsible disposal facility operator are insufficient or unavailable to pay the necessary cost of remediation.

14. NOTICES

All notices and communications herein required shall be in writing to the other party as follows, unless expressly changed in writing:

City of Cupertino

City Manager
City of Cupertino

Santa Clara County

Lee Esquibel, Director
Environmental Health
Department of Public Health
County of Santa Clara
2220 Moorpark Avenue
San Jose, CA 95128

IN WITNESS WHEREOF, the parties have executed this Agreement.

"CITY"

CITY OF CUPERTINO,
a municipal corporation.

By:

Barb Koppel
Mayor

Attest:

City Clerk

APPROVED AS TO FORM:

City Attorney

"COUNTY"

COUNTY OF SANTA CLARA, a political subdivision of the State of California.

Chairperson, Board of Supervisor

Attest:

Clerk, Board of Supervisors

APPROVED AS TO FORM AND LEGALITY:

Kathy Ketchmer
Deputy County Counsel

hhw:8/91:ik

ATTACHMENT A

ENVIRONMENTAL HEALTH OFFICE OF TOXICS ENFORCEMENT PRELIMINARY SCHEDULE FOR MOBILE HHW COLLECTION EVENTS*

JURISDICTION	(400 CAR EVENTS) Oct-Dec	(400 CAR EVENTS) Jan-Feb	(600 CAR EVENTS) Mar-Apr	(600 CAR EVENTS) May-Jun	Total
West Valley (1260) Campbell (250) Los Gatos (400) Monte Sereno (110) Saratoga (500)	1	1	1	0	3
North County (2000) Cupertino (300) Los Altos (600) Los Altos Hills (100) Mountain View (1000)	1	1	1	1	4
San Jose (3900)	1	2	2	3	8
Milpitas, Sunnyvale, Santa Clara (1200) Milpitas (500) Santa Clara (100) Sunnyvale (600)	0	1	1	1	3
Unincorporated (1000)	0	0	0	1	1
TOTAL EVENTS	3	5	5	6	19
CARS X EVENTS	(400 X 3) + (400 X 5) + (600 X 5) + (600 X 6) = 9,800				

* A mobile collection event may be have appointments scheduled for two consecutive days in accordance with the proposed Permit by Rule Regulations.

9/4/91smd