Source Reduction and Recycling Element
City of Morgan Hill, California

Prepared for

City of Morgan Hill

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Responses to comments received on the Preliminary Draft Source Reduction and Recycling Element (January 1992), with the exception of the Waste Disposal Characterization Study, have been incorporated into the text of this final document. Responses to comments on the Waste Disposal Characterization Study are presented in Appendix 2 along with that Study

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EXECUTIVE SUMMARY

INTRODUCTION

Legislative Basis for the Plan

The California Integrated Waste Management Act of 1989 (Assembly Bill [AB] 939), mandates that by January 1, 1995, each California city and county must divert 25 percent of all solid waste generated within the jurisdiction from landfill or transformation facilities through source reduction, recycling, and composting activities. By January 1, 2000, the required waste diversion is 50 percent of the solid waste generated in each California city and county. AB 939 responds to the pressing need to divert materials from disposal in landfills in order to preserve decreasing site capacity and diminishing natural resources.

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

- waste generation study (Section 2)
- source reduction component (Section 3)
- recycling component (Section 4)
- composting component (Section 5)
- special waste component (Section 6)
- education and public information component (Section 7)
- disposal facility capacity component (Section 8)
- funding component (Section 9)
- integration component (Section 10)

- household hazardous waste element[1]

The integrated waste management hierarchy established by AB 939 is as follows:

- Source reduction to reduce generation of wastes
- Recycling and composting of materials
- Environmentally safe transformation of wastes, such as incineration, destructive distillation, gasification and pyrolysis
- Environmentally safe landfilling

This SRRE applies this hierarchy as a planning tool in the selection of programs designed to meet the AB 939 25 and 50 percent diversion goals by 1995 and 2000, respectively.

Goals for the SRRE

The primary goal of the City of Morgan Hill's SRRE is to meet the State-mandated waste diversion goals of 25 and 50 percent by 1995 and 2000, respectively. The following goals have guided the development of the SRRE:

1. Meet or exceed state-mandated waste diversion rates through source reduction, recycling, and composting.
2. Support and encourage regional approaches to solid waste management.
3. Maximize source reduction, recycling, and composting opportunities within the City.
4. Minimize adverse environmental impacts and ensure public health and safety.
5. Increase public awareness of the need to reduce and recycle the solid waste stream and provide information on how to participate in the local community programs.

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1 Following the enactment of AB 2707, the household hazardous waste component was elevated to the status of an element, to be prepared as a separate document. This element is therefore presented under separate cover.

6. Expand and develop the sense of community pride in order to maximize participation in source reduction, recycling, and composting programs.

7. Encourage and foster the participation of solid waste refuse collectors and the commercial sector in the solid waste management planning process and the implementation of necessary programs.

8. Develop and expand local and regional markets for diverted materials, including the City's purchase of products made from recycled materials.

9. Ensure proper disposal of wastes that cannot be reduced, reused, recycled, or composted.

10. Divert hazardous wastes from disposal in landfills.

11. Extend landfill life in the County.

MANDATED FORMAT OF SRRE

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

- Objectives
- Existing Conditions Description
- Evaluation of Alternatives
- Program Implementation
- Monitoring and Evaluation

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

The remaining four components of the City's SRRE - education/public information, disposal facility capacity, funding, and integration - deviate somewhat in format from the first four, as will be noted from a review of the SRRE. The apparent lack of consistency in the format is thus dictated by the regulations for Planning Guidelines and Procedures for Preparing

and Revising Countywide Integrated Waste Management Plan (Title 14, CCR, Division 7, Chapter 9, Articles 3, 6.1, 6.2, 7, and 8).

WASTE GENERATION STUDY

In compliance with AB 939, the City is required to identify the composition and quantity of solid wastes disposed of in the landfill. In addition, the City is required to identify quantities of solid waste that are currently being diverted or have the potential of being diverted from the landfill.

Waste Disposal Characterization

The City of Morgan Hill's waste disposal characterization was conducted during a single sampling period from April 1 to 5, 1991 at the San Martin Transfer Station and Recycling Center. A sampling protocol was developed and samples were collected from residential, commercial, and industrial waste sources. A visual survey was conducted from April 1 to 7, 1991 at the San Martin Transfer Station to characterize self-haul wastes. Records were obtained from the haulers and from the scalehouse to determine waste quantities for each of the characterized waste streams: residential, commercial, industrial, and self-haul.

Waste characterization data was analyzed according to categories of waste materials that included paper, plastics, glass, metals, yard waste, other organics, and special wastes. These waste categories were further subdivided into types of materials within each category. Based on the results of this study, approximately 26 percent of the disposed of waste stream (including transformation/incineration) is residential, 25 percent is commercial, 23 percent is industrial, and 24 percent of the waste stream is self-hauled.

A summary of the City's disposed and diverted waste quantities is presented in Table ES-1. The composition of the City's landfilled wastestream is shown in Table ES-2. A total of 28,896 tons are disposed or transformed from the City of Morgan Hill annually (or about 79 tons per day on a seven-day week basis).

Waste Diversion

In compliance with AB 939, the City also conducted a waste diversion study to estimate the quantities of materials diverted from landfill through recycling, composting, and source reduction. The diversion results were

obtained from (1) City records, (2) the collectors of recyclable materials, and (3) a telephone survey of businesses in the City concerning their waste generation and diversion activities. The data from the City records and from the surveys were assumed to reflect the total diverted quantities (i.e., the data were not extrapolated). The study results indicate diversion estimate total of 6.9 percent.

Table ES-1 presents a summary of wastes disposed, diverted, and generated in Morgan Hill.

Materials Targeted for Diversion

The following categories of materials currently disposed of in the City are targeted for diversion through programs identified in the source reduction, recycling, composting, and special waste components of the SRRE: paper, plastics, glass, metals, yard and wood wastes, other organics, and selected other wastes, including white goods and inert solids such as asphalt, concrete, and soil.

OVERVIEW OF SRRE COMPONENTS

Source Reduction Component

Source reduction activities reduce or prevent the generation of solid wastes that must otherwise be managed by recycling, composting, transformation, and disposal. Source reduction is achieved by changing production, packaging, and consumption practices, resulting in decreased consumption; reduced material weight, volume and toxicity; and increased product durability. Production and packaging practices are changed at the state or national level, while consumption patterns are targeted locally.

The source reduction programs selected to help meet Morgan Hill's diversion goals have the potential to effectively change consumption patterns. The City of Morgan Hill proposes to implement public education programs that focus on increasing the consumer's level of awareness. Specifically, the following programs were selected for implementation prior to 1995:

Technical Assistance, Education, and Promotion

- A program to provide technical assistance to businesses and consumers/homeowners through workshops and seminars on source reduction techniques and activities.
- A program to provide public education efforts through the media, the school system, and City offices to increase awareness of source reduction and waste management issues.
- A program to provide public recognition and awards to individuals and businesses that implement source reduction activities.
- A program to promote backyard composting and xeriscaping.

For the period 1995-2000, the following programs have been selected:

Regulatory Programs. The City will establish land-use requirements that promote waste management planning.

Rate Structure Modifications. The City of Morgan Hill will work with SVRD to implement modifications to the current residential rate structure for collection and disposal. These modifications will take the form of a quantity-based user fee designed to encourage source reduction of materials that are not reusable, recyclable, or compostable.

Although the City's State-mandated diversion rates will be met primarily through recycling and composting programs, the City intends to emphasize the implementation of the above listed programs. Although the impact of the programs is difficult to quantify, the City will attempt to monitor the effectiveness of the source reduction programs. The cost of these programs will be integrated with those of the Education and Public Information component described below. The success of the source reduction program will have positive impacts on consumption, production, and packaging patterns that will ultimately contribute to a decrease in the quantity of wastes landfilled.

Recycling Component

As defined by the EPA-sponsored national Recycling Advisory Council, recycling is the result of "a series of activities by which materials that

would become or otherwise remain waste are diverted from the solid waste stream for collection, separation, and processing and are used as raw materials or feedstocks in lieu of, or in addition to, virgin materials in the manufacture of goods sold or distributed in commerce, or the reuse of such materials as substitutes for goods made from virgin materials."

The recycling programs selected to help meet the City's mandated diversion goals spread the responsibility for diverting waste to all generators of the waste stream, including residential, commercial, industrial, and self-haul waste generators. Recycling programs targeted at specific waste generators are therefore an important component of the City's approach to meeting mandated diversion goals. The following programs were selected for implementation prior to 1995:

Residential curbside collection program for recyclables. This program will result in diversion of approximately 3.2 percent of the total waste stream for the following materials: aluminum and tin cans, PET, HDPE, polystyrene foam, corrugated cardboard, newspaper, CA redemption and other recyclable glass. Total program cost when fully implemented is estimated to be $149,000 per year.

Source-separated recycling program for multi-family dwellings. This program will result in 0.8 percent diversion of the total waste stream for the following materials: aluminum and tin cans, PET, HDPE, polystyrene-foam, newspaper, corrugated cardboard, CA redemption and other recyclable glass. Total program cost when fully implemented is estimated to be $37,000 per year.

Commercial recycling program. This program will result in 2.1 percent diversion of the total waste stream from corrugated cardboard recycling. Total program cost when fully implemented is estimated to be $64,000 per year.

Salvage at solid waste facility program. A salvage program will be continued for recyclable or reusable materials hauled to the San Martin transfer station and the Pacheco Pass Landfill. This program will result in 3.0 percent diversion of the total waste stream from Morgan Hill for the following materials: Ferrous metals and inert solids. Total program cost when fully implemented is estimated to be $47,000 per year.

All programs and alternatives selected in the short-term planning period (1995) will be continued in the medium-term (2000). In addition, the City

has selected the following programs and alternatives for the period 1995-2000.

Commercial recycling program. This program will result in additional diversion (7 to 8 percent) of the total waste stream for the following materials: mixed paper, newsprint, magazines, high grade paper, CA redemption and other recyclable glass, aluminum cans, tin cans, ferrous metals, wood, and inert solids. Total program cost when fully implemented is estimated to be $307,000 per year for total program diversion of 9.9 percent.

Manual/mechanized material recovery operation. This facility will receive and process the commingled recyclable materials collected through residential and commercial recycling programs. Total cost of this program when fully implemented is estimated to be $146,000 per year. (The MRF will not result in additional diversion. It is designed to process collected materials more efficiently).

For the period 1995-2000, the selected programs all represent expansions of the programs listed above and most importantly include the development of a material recovery facility (MRF). The MRF would enable many recyclable materials to be collected together (commingled). At the MRF materials would be sorted and prepared for shipping to markets. The City plans to use the proposed SVRD MRF to process its collected materials.

Composting Component

Composting is a process of biological decomposition of solid organic debris, such as leaves, grass clippings, and other organic materials commonly found in the municipal waste stream. 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.

Yard wastes make up a large percent of the wastestream in Morgan Hill, comprising approximately 17 percent by weight of the disposed wastestream. Composting therefore makes an important contribution to reducing the amount of waste that is disposed of at the landfill. The following programs were selected for implementation prior to 1995:

- A yard waste drop-off program
- A windrow composting system

In addition, the selected program to be implemented in the 1995-2000 period includes:

- A residential yard waste collection program

As with the development of a MRF, a larger multi-jurisdiction composting facility may be able to be constructed so as to offer economies-of-scale. The composting program is expected to divert 10.6 percent of the total waste stream prior to 1995 at a cost of $83,000 ($25 per ton diverted) per year when fully implemented. During the 1995-2000 period, the program is expected to divert 17.4 percent of the total waste stream at the cost of $135,000 per year when fully implemented. These costs do not include projected revenues from the sale of the compost product.

Special Waste Component

Special waste is solid waste requiring collection, processing, and disposal procedures that differ from those typically needed for other municipal solid wastes. Examples are sewage sludge, ash, asbestos, tires, white goods, mattresses, abandoned vehicles, and dead animals. Asbestos, abandoned vehicles, used tires, dead animals, and white goods are the only special wastes from Morgan Hill currently disposed of at the Pacheco Pass landfill. The landfill facility, the City of Morgan Hill, and the County of Santa Clara operate programs to divert these waste materials from disposal at the landfill. These programs will continue, and the City will work with SVRD to initiate a new program to prohibit used tires from disposal at the landfill.

Education and Public Information Component

The City of Morgan Hill will implement an education and public information program. Education and public information are essential to the successful implementation of recycling, source reduction, and composting components. To reach waste diversion goals of 25 and 50 percent, the City will target the specific sectors of the community to ensure the success of selected waste diversion programs. The City will also inform the entire community about expansions and modifications to existing programs so that the City can effectively reach its stated diversion goals.

The education and public information component presented in the City's SRRE describes a wide variety of programs that focus on educating and informing the community about solid waste issues. Education and public

information programs promoted by businesses and community groups in the City are also described in this component. The education and public information activities selected to enhance existing programs are multi-faceted in scope, encompassing media, community outreach, campaigns, and school curricula.

Disposal Facility Capacity

The Integrated Waste Management Act of 1989 requires that jurisdictions identify their current and future solid waste disposal capacity needs in the SRRE. Specifically, the City of Morgan Hill is required to identify its disposal capacity over the 15 year period 1991 through 2006. In Morgan Hill, there are no permitted solid waste disposal facilities within the incorporated limits of the City; all of the City's solid waste destined for disposal is currently exported to permitted solid waste disposal facilities in the County of Santa Clara. SVRD's franchise agreement expires in January 2008. Under this agreement, SVRD is responsible for collecting and disposing of the solid waste generated in Morgan Hill. Because SVRD's Pacheco Pass Landfill, which receives Morgan Hill's waste, is estimated to close in September 2000, SVRD will have to locate additional disposal capacity to meet the City's needs.

Funding

The source of funding for the City of Morgan Hill's solid waste management activities is the City's refuse enterprise fund. This fund is comprised of refuse collection fees paid by City residents and commercial collection customers, and covers the cost of supplying waste collection and disposal services that are provided by South Valley Refuse Disposal, Inc.

An additional source of funding available to the City is a surcharge authorized by AB 939 and collected on the tipping fee at the landfill. Through an apportionment schedule, a portion of the collected funds can be distributed to the enterprise funds of the various cities in the County.

Estimated costs have been determined for each of the new or expanded programs that have been identified for implementation during the short-term planning period. Table ES-3 shows the estimated costs for (1) planning/program development, (2) implementation (capital and operating costs), and (3) monitoring for each of these programs, by year,

for 1991 through 1995. Capital costs include equipment purchases and new or improved structures. Operating costs include operations and maintenance, publications and other promotional materials, City staff time, and other expenses. The implementation cost is an estimate of the annual cost to supply the service assuming amortization of capital costs.

One additional staff position, an environmental programs assistant, will be added to the City's Community Development Department staff in 1992. This new staff position, along with existing staff, will be responsible for planning, developing, implementing, and monitoring the programs identified in this document (Sections 3 through 7). The environmental programs assistant will work on duties associated with the various recycling program elements and will also coordinate the composting program and public education efforts. Volunteers or interns will be utilized for tasks such as conducting surveys required for program monitoring, evaluation, and reporting. Costs for the additional staff position are listed separately in Table ES-3.

The source of funding to implement the short-term programs identified in Sections 3 through 7 of this document will be the Refuse Enterprise Fund. It is anticipated that the Fund's current revenue sources will be inadequate to cover the cost of these short-term programs. The City plans to implement a refuse collection fee increase to cover the cost of these additional programs. This rate increase will be phased in over the short-term planning period beginning in 1992.

Integration

To reach the waste diversion goals mandated by AB 939, the City must integrate source reduction, recycling, composting and special waste programs and activities following the integrated waste management hierarchy of (1) source reduction, (2) recycling and composting, and (3) environmentally safe transformation and disposal. A combination of existing waste diversion programs, planned expansions of existing programs, and new source reduction, recycling and composting programs and activities together will contribute to the City's achieving the diversion targets mandated by law. Currently, the City diverts an estimated 6.9 percent of its solid wastes from the landfill. By 1995, the City projects a diversion rate of 27 percent; by 2000, a rate of 52 percent.

SUMMARY OF SELECTED PROGRAMS

Summarized below are diversion programs selected by the City based on the City's current waste generation profile, existing diversion rate, and required target rates of 25 percent by 1995 and 50 percent by 2000.

Source Reduction

Short-term planning period

- Public education and technical assistance

Medium-term planning period

- Rate modifications
- Regulatory programs (land-use requirements)

Recycling

Short-term planning period

- Residential curbside recycling program
- Multi-family recycling program
- Commercial recycling program
- Industrial and self-haul salvage program at solid waste facility

Medium-term planning period

- Manual material recovery operation/mechanized material recovery operation for residential, multi-family, and commercial waste stream.
- Include additional waste types in the residential, multi-family, and commercial programs

Composting

Short-term planning period

- Yard waste drop-off program
- Windrow composting/yard waste processing system

Medium-term planning period

- Residential yard waste collection program

Special Waste

Short-term and medium-term planning periods

- Prohibit disposal of used tires at the landfill

Public Education

Short-term and medium-term planning periods

- Public education efforts in support of source reduction, recycling, and composting programs, including:
  - Information
  - Outreach
  - Technical Assistance
  - Public Awareness
  - Education

Table ES-1

Disposal and Diversion Quantities By Material For the Solid Waste Stream (Tons, 1990)

City of Morgan Hill

MATERIAL	DISPOSED *	DIVERTED	GENERATED	DIVERSION RATE (%)
PAPER (total)	7,611	562	8,173	7
OCC/Kraft	2,334	90	2,424	4
Magazines	367	0	367	0
Mixed Paper	1,871	0	1,871	0
Newsprint	1,111	446	1,557	29
High Grade	154	26	180	14
Other Paper	1,774	0	1,774	0
PLASTICS (total)	1,732	15	1,747	1
HDPE	156	7	163	4
PET	60	8	68	12
Film	869	0	869	0
Polystyrene Foam	95	0	95	0
Other Plastic	552	0	552	0
GLASS (total)	653	377	1,030	37
Refillable Beverage	7	103	110	94
CA Redemption Value	288	271	559	48
Other Recyclable	290	3	293	1
Other Non-Recyclable	68	0	68	0
METALS (total)	3,027	871	3,898	22
Aluminum Cans	92	98	190	52
Other Aluminum	814	0	814	0
Bi-metal Cans	27	0	27	0
Steel Food & Bev. Cans	286	0	286	0
Other Ferrous	1,690	268	1,958	14
Other Non-ferrous	5	39	44	89
White Goods	113	467	580	81
YARD WASTE (total)	5,019	80	5,099	0
OTHER ORGANICS (total)	9,563	229	9,792	2
Food	1,764	0	1,764	0
Rubber/Tires	199	2	201	1
Wood	4,199	98	4,297	2
Agri. Crop Residue	226	0	226	0
Manure	0	0	0	0
Textiles/Leather	1,014	80	1,094	7
Other Organics **	2,161	50	2,211	2
OTHER WASTES (total)	1,259	7	1,266	1
Inert Solids	1,229	0	1,229	0
Hazardous Waste	30	7	37	19
SPECIAL WASTES (total)	32	6	38	17
Small Household Appliances	32	6	38	17
TOTAL	28,896	2,148	31,044	6.9

* Includes transformation of 495.3 tons of wood wastes and 2.3 tons of tires.

** "Other Organics" includes diapers.

Table ES-2

Table 2. Average Composition (% Weight) and Annual Quantities (Tons/Year) of Disposed Waste.

Morgan Hill
April 1-7, 1991
Waste Characterization

Material	Residential N = 9 %	Residential N = 9 TPY	Commercial N = 7 %	Commercial N = 7 TPY	Industrial N = 8 %	Industrial N = 8 TPY	Self Haul (Visual) %	Self Haul (Visual) TPY	Total Disposed %	Total Disposed TPY
1) TOTAL PAPER	36.2	2723	41.9	3020	13.4	909	13.9	959	26.8	7610
OCC/Kraft	6.1	460	14.8	1068	6.1	413	5.7	393	9.2	2334
Mixed Paper	9.2	694	10.6	763	4.5	308	1.5	107	6.6	1871
Newsprint	9.9	747	3.5	253	0.6	38	1.0	72	3.9	1111
High-Grade	0.2	18	1.6	117	0.0	0	0.3	18	0.5	154
Magazines/Glossy ins.	2.7	207	2.1	149	0.0	0	0.2	12	1.3	367
Other Paper	7.9	598	9.3	670	2.2	150	5.2	358	6.2	1774
2) TOTAL PLASTICS	6.9	521	6.5	470	6.1	412	4.8	330	6.1	1732
HDPE	0.6	46	0.6	41	0.8	55	0.2	13	0.5	156
PET	0.3	25	0.1	5	0.4	30	0.0	1	0.2	50
Film	3.7	277	4.0	290	1.1	73	3.3	229	3.1	869
Polystyrene foam	0.3	20	0.5	33	0.5	34	0.1	8	0.3	95
Other Plastics	2.0	152	1.4	101	3.3	220	1.1	78	1.9	552
3) TOTAL GLASS	4.7	356	2.5	182	0.4	30	1.2	86	2.3	653
Refillable Glass Bev.	0.0	3	0.0	1	0.0	0	0.1	4	0.0	7
Calif. Redemption Value	2.4	180	1.2	88	0.2	13	0.1	7	1.0	288
Other Recyclable	2.3	172	1.3	92	0.3	17	0.1	8	1.0	290
Other Non-Recyclable	0.0	0	0.0	1	0.0	0	1.0	67	0.2	68
4) TOTAL METALS	9.8	733	5.0	363	17.9	1215	10.4	718	10.7	3027
Aluminum Cans	0.3	25	0.2	13	0.8	51	0.0	3	0.3	92
Bimetal Cans	0.0	2	0.0	0	0.0	0	0.4	25	0.1	27
Tin F&B Cans	1.4	105	0.7	51	0.6	42	1.3	87	1.0	286
Other Aluminum	5.5	410	3.0	213	2.5	178	0.2	13	2.9	814
Other Ferrous	2.5	191	1.2	85	13.9	939	6.9	474	6.0	1690
Non-Ferrous	0.0	0	0.0	0	0.1	4	0.0	0	0.0	5
White Goods	0.0	0	0.0	0	0.0	0	1.6	113	0.4	113
5) YARD WASTES	23.3	1754	17.0	1223	2.9	195	26.8	1846	17.7	5019
6) OTHER ORGANICS	17.6	1325	25.3	1820	56.1	3800	30.7	2120	31.9	9066
Food	6.7	507	15.8	1136	0.0	0	1.8	122	6.2	1764
Tires/Rubber	0.3	24	0.2	17	2.0	136	0.3	20	0.7	196
Wood	3.2	243	3.0	217	24.6	1664	22.9	1580	13.0	3704
Ag. Crop Residue	0.0	0	0.0	0	0.0	0	3.3	226	0.8	226
Manure	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Textiles/Leather	3.2	240	2.4	175	3.9	500	0.0	0	3.6	1014
Other Misc. Organics	4.2	312	3.8	276	20.7	1401	2.5	173	7.6	2162
7) OTHER WASTES	1.3	95	1.5	112	3.2	218	12.1	838	4.4	1259
Inert Solids	1.2	88	1.3	95	3.1	212	12.1	835	4.3	1229
HHW	0.1	7	0.2	17	0.1	4	0.0	1	0.1	30
8) OTHER SPECIAL WASTES a)	0.2	13	0.2	17	0.0	0	0.0	3	0.1	32
Total	100.0	7520	100.0	7206	100.0	6776	100.0	6896	100.0	28398

Average may not sum to 100% due to rounding.
a) Small Household Appliances

TPY = Tons Per Year
N = Number of Vehicles Samples

Table ES-3
Funds Required for Planning, Implementation, and Monitoring of Programs
to be Implemented in the Short-Term Planning Period[1]

	1992	1993	1994	1995
Source Reduction - Public Education and Technical Assistance				
Planning/Program Development				
Implementation (Capital, Operations & Maintenance)	___[2]	___[2]	___[2]	___[2]
Monitoring				
Education and Public Information Program				
Planning/Program Development	20,000	10,000		
Implementation (Capital, Operations & Maintenance)	28,000	26,000	30,000	30,000
Monitoring		4,000	4,000	4,000
Recycling - Curbside Collection				
Planning/Program Development	14,000	10,000		
Implementation (Capital, Operations & Maintenance)	90,000	135,000	145,000	145,000
Monitoring		4,000	4,000	4,000
Recycling - Multi-family Curbside Collection				
Planning/Program Development	5,000	5,000		
Implementation (Capital, Operations & Maintenance)	2,500	15,000	35,000	35,000
Monitoring		2,000	2,000	2,000
Recycling - Commercial Collection				
Planning/Program Development	9,000	10,000		
Implementation (Capital, Operations & Maintenance)	4,000	25,000	60,000	60,000
Monitoring		3,000	4,000	4,000
Recycling - Salvage at Solid Waste Facilities				
Planning/Program Development	8,000	4,000		
Implementation (Capital, Operations & Maintenance)	20,000	40,000	44,000	44,000
Monitoring		3,000	3,000	3,000

Table ES-3
Funds Required for Planning, Implementation, and Monitoring of Programs
to be Implemented in the Short-Term Planning Period[1]

	1992	1993	1994	1995
Composting - Yard Waste Processing				
Planning/Program Development		20,000	17,000	
Implementation (Capital, Operations & Maintenance)		14,000	80,000	83,000
Monitoring			3,000	3,000
Recycling/Composting/Public Education Program Coordinator[3]	38,000	38,000	38,000	38,000
TOTAL	**238,500**	**368,000**	**469,000**	**455,000**

1. In accordance with AB 939, programs scheduled for the medium-term planning period are not included in this table. Costs are in 1991 constant dollars.
2. Costs are included in education and public information program.
3. Cost includes a Salary multiplier of approximately 1.4 for benefits.

1 INTRODUCTION

1.1 Legislative Basis for the Plan

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

AB 939 replaces the existing County Solid Waste Management Plan (CoSWMP) process with a source reduction and recycling element (SRRE) for each city and county and an Integrated Waste Management Plan (IWMP) for each county. AB 939 dramatically restructures the solid waste management program in California with the objective of implementing an aggressive integrated waste management program, promoting, in order of priority, the following waste management practices.

- Source reduction
- Recycling and composting
- Environmentally safe transformation (incineration, pyrolysis, and destructive distillation)
- Environmentally safe land disposal

1.1.1 City Requirements

By July 1, 1991, each city must prepare, adopt, and submit to the county a SRRE that includes a component focusing on each of the following areas for management of solid waste generated within the city.

- Waste generation
- Source reduction
- Recycling
- Composting
- Disposal facility capacity
- Education and public information
- Special wastes
- Program funding
- Program integration

Assembly Bill 2092 is currently pending and will extend the date for preparation and adoption of the SRRE and HHWE by six months to January 1, 1992.

1.1.2 County Requirements

By July 1, 1991, each county must prepare a SRRE for its unincorporated area with components identical to those required in the city elements. Each county must also prepare a county-wide integrated waste management plan and a county-wide siting element specifying areas for transformation or disposal sites to provide capacity needed for a 15-year period, so that solid wastes generated in the county that cannot be reduced or recycled will be handled safely. Assembly Bill 2092 is currently pending and will extend the date for preparation and adoption of the SRRE and HHWE by six months to January 1, 1992. In addition, AB 2092 will also extend the date for submittal of the County IWMP by six months to July 1, 1992.

1.1.3 General Requirements

The required waste diversion amounts will be based on the calculated amount of solid waste existing on the date of approval of the city or county SRRE.

To determine the base rate of solid waste from which these recycling levels will be calculated, "solid waste" includes only two categories:

- Materials that are normally disposed of at a landfill or transformation facility; and
- Solid wastes currently diverted from a landfill or transformation facility because of source reduction, recycling, or composting activities.

Agricultural wastes, and other wastes not normally disposed of at landfills are not included in this base rate calculation.

For any plan submitted after January 1, 1995, the 50 percent diversion may include up to 10 percent transformation, provided that the front-end removal of recyclable materials and other specified conditions are met.

1.1.4 Other Provisions of AB 939

Revisions to existing law in AB 939 include (1) replacement of the former Waste Management Board by the current Integrated Waste Management Board with six full-time members; (2) implementation of new requirements in the city and county waste management planning process; (3) recasting of the waste management framework; and (4) various funding mechanisms for the required programs and plans. There are six additional provisions of AB 939.

Solid Waste Facilities. AB 939 establishes a comprehensive statewide system of permitting, inspections, enforcement, cleanup, maintenance, and closure for solid waste facilities. While the system will continue to be implemented by local jurisdictions where applicable, the state's role has generally been strengthened. Specifically, local enforcement agencies (LEAs) will be subject to Board certification. The Board will prepare and adopt certification regulations specifying requirements that a local enforcement agency shall meet before being designated officially as an enforcement agency.

The Board will also adopt minimum standards for solid waste handling and disposal to protect air, water, and land from pollution. Owners or operators of solid waste landfills must also provide financial assurances for closure and postclosure maintenance.

Enforcement. AB 939 outlines a system of civil penalties, corrective actions, appeals, and judicial review for the enforcement of terms and conditions of solid waste facility permits. The Board may issue a cease and desist or cleanup and abatement order if (1) the LEA fails to issue

such orders and (2) the Board agrees that such orders need to be imposed.

Solid Waste Disposal Site Cleanup and Maintenance. Every operator of a solid waste landfill required to have a permit will be assessed a fee, which will be placed in the existing Solid Waste Disposal Site Cleanup and Maintenance Account in the Solid Waste Management Fund. Money in the account will be controlled by the Board and allocated to cities and counties for uses regarding the safe operation, closure, and maintenance of solid waste landfills.

Household Hazardous Wastes. AB 939 requires the Board to develop and implement a public information program to provide information on the proper disposal of household hazardous wastes, and technical assistance to local public agencies to establish household hazardous waste management programs.

Finances. Every operator of a solid waste landfill shall pay a quarterly fee to the Board of Equalization, based on all solid waste disposed of at each disposal site on or after January 1, 1990. The money will be used for administration and other purposes specified by the legislature, which will appropriate funds from the account.

Garbage and Refuse Disposal. AB 939 establishes criteria for (1) the formation of garbage disposal districts, funded by property taxes; (2) franchise waste management within a county; (3) contract waste management within a city; and (4) solid waste enterprises to operate within a community. It also contains restrictions on burning garbage.

1.1.5 Relationship of AB 939 to Other Legislation

Several pieces of legislation related to AB 939 have passed that modify the impact of the legislation, including the following five bills.

Senate Bill (SB) 1322. This bill establishes a comprehensive set of state programs to promote (1) integrated waste management, (2) source reduction, and (3) market development for recovered materials. SB 1322 will establish recycling market development zones with regulatory and fiscal incentives. In addition, the Board will be required to provide technical assistance to enable LEAs to conduct waste reduction evaluations and implement recovery of high-grade white office paper. A state-wide public information and education program will be initiated to encourage participa-

tion by the general public, business, government, and industry in all phases of integrated waste management.

Assembly Bill (AB) 1820. AB 1820 permits the use of pre-existing data or studies that accurately characterize the waste generated and disposed of within the jurisdiction. This bill allows for three basic changes to AB 939: (1) only the amount of seasonal sampling necessary to achieve the 25 percent diversion target for the 1995 deadline (rather than the "maximum extent possible"); (2) the constituent materials identified in the waste characterization to be representative of the solid waste generated (in contrast to the former language: to be representative "to the maximum extent feasible;" and (3) waste quantities to be "as accurate as possible" to enable the Board to accurately measure the diversion requirements.

Assembly Bill (AB) 2092. This bill extends the dates for preparation, adoption, and submittal of the Source Reduction and Recycling Element (SRRE) and the Household Hazardous Waste Element (HHWE) by 6 months to January 1, 1992. This bill also extends the date for submittal of the first tier County Integrated Waste Management Plans (CIWMP) by 6 months to July 1, 1992. AB 2092 has not yet passed the legislature.

Assembly Bill (AB) 2707. This bill requires each city to submit a separate household hazardous waste element to the county by July 1, 1991. AB 939 had included a household hazardous waste component in the SRRE; as a result of AB 2707, this component was elevated to the status of an "Element."

Assembly Bill (AB) 3992. This bill defines "solid waste" for the purpose of determining the base amount from which diversion levels shall be calculated. It also requires the Board to consider only relevant circumstances in determining civil penalties for any city or county which fails to implement its SRRE.

1.2 Goals of the City of Morgan Hill SRRE

Definition of Goals and Objectives

The primary intent of the City's SRRE is to meet the state-mandated waste diversion goals of 25 and 50 percent by 1995 and 2000, respectively.

Goals are stated in general terms and are not quantified by target dates, waste types, or volumes. Goals are general statements of policy and will

be used to guide the overall direction of the solid waste management program within the City.

Objectives are more specific and serve to target certain aspects of the overall goals. Objectives are based in part on local considerations necessary to achieve state-mandated diversion rates. Generally, objectives are stated in measurable and quantifiable terms. Objectives for programs are presented in their respective components.

Goals for the City

1. Meet or exceed state-mandated waste diversion rates through source reduction, recycling, and composting.

2. Support and encourage regional approaches to solid waste management.

3. Maximize source reduction, recycling, and composting opportunities within the City.

4. Minimize adverse environmental impacts and ensure public health and safety.

5. Increase public awareness of the need to reduce and recycle the solid waste stream and provide information on how to participate in the local community programs.

6. Expand and develop the sense of community pride in order to maximize participation in source reduction, recycling, and composting programs.

7. Encourage and foster the participation of solid waste refuse collectors and the commercial sector in the solid waste management planning process and the implementation of necessary programs.

8. Develop and expand local and regional markets for diverted materials, including the City's purchase of products made from recycled materials.

9. Ensure proper disposal of wastes that cannot be reduced, reused, recycled, or composted.

10. Divert hazardous wastes from disposal in landfills.

11. Extend landfill life in the County.

1.3 Mandated Format of SRRE

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

- Objectives
- Existing Conditions Description
- Evaluation of Alternatives
- Program Selection
- Program Implementation
- Monitoring and Evaluation

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

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

1.4 Evaluation of Alternatives in the SRRE

The Planning Guidelines and Procedures for Preparing and Revising Countywide Integrated Waste Management Plans, Section 18733.3, Chapter 9, Division 7, Title 14, California Code of Regulations, require certain criteria to be used in evaluating alternative programs identified in the source reduction, recycling, composting, and special wastes components. These criteria reflect a broad range of technical, economic, and socio-political considerations. As presented in Section 18733.3 of Article 6.2 of Title 14, the evaluation criteria are as follows:

- Effectiveness

- Hazard
- Ability to Accommodate Change
- Consequences on the Waste Stream
- Implementation Period
- Facility Requirements
- Consistency with Local Plans and Policies
- Institutional Barriers
- Estimated Cost
- End Uses

As structured by the regulations governing AB 939, some of the criteria by which the alternatives are required to be evaluated are positive in tone (e.g., Effectiveness), while others are inherently negative (e.g., Hazard). A high rating for a positive criterion implies a positive rating; on the other hand, a high rating for a negative criterion corresponds to few or no impacts associated with this potential problem. A detailed discussion of the evaluation criteria and the method used to rank their impact on the alternative is presented in Appendix 1 of this SRRE.

1.5 Organization of the SRRE

In accordance with the regulations implementing AB 939, the SRRE is presented in the following sections:

- Solid Waste Generation Study - **Section 2**
- Source Reduction Component - **Section 3**
- Recycling Component - **Section 4**
- Composting Component - **Section 5**
- Special Waste Component - **Section 6**
- Education and Public Information Component - **Section 7**
- Disposal Facility Capacity Component - **Section 8**
- Funding Component - **Section 9**
- Integration Component - **Section 10**

The organization of topics within each component generally follows the format presented below. The format deviates slightly between components, however, as applicable to each respective component.

- Introduction
- Objectives
- Existing Conditions Description
- Evaluation of Alternatives[1]
- Selection of Programs
- Program Implementation
- Monitoring and Evaluation

[1] A description of the criteria used to evaluate the alternatives is included in the appendix.

2 SOLID WASTE GENERATION ANALYSIS

2.1 Introduction

The solid waste generation analysis is based on information contained in two separate reports which have been prepared as a result of requirements of AB 939. The first information source is titled "Disposed Waste Characterization Study" (DWCS) and was prepared for the City of Morgan Hill by CalRecovery Inc., dated July 1991. A copy of this report is attached in Appendix 2. The second information source is titled "Methodology for Solid Waste Diversion Characterization - County of Santa Clara." This report was prepared for the County of Santa Clara by EMCON Associates, dated May 1991. A copy of the portion of this report that pertains to Morgan Hill is attached in Appendix 3. In addition, a telephone survey of businesses, recyclers, and materials brokers was conducted to identify any additional sources at diverted material. A summary of the information from the solid waste disposal and diversion characterizations is presented in Table 2-1. The composition of the Citys landfilled wastestream is shown in Table 2-2.

This section identifies materials that are currently disposed of, materials that are diverted from disposal, materials that could potentially be diverted from disposal, and materials that cannot be diverted from disposal.

2.2 Waste Disposal Characterization

The City of Morgan Hill's waste disposal characterization is based on a disposal characterization study for the City (July 1991) prepared by Cal Recovery Incorporated. The study was conducted consistent with the requirements of the AB 939 regulations. According to the study, the characterization was conducted during a single sampling period from April 1 to 5, 1991 at the San Martin Transfer Station and Recycling Center. A sampling protocol was developed and samples were collected from residential, commercial, and industrial waste sources. A visual survey was

conducted from April 1 to 7, 1991 at the San Martin Transfer Station to characterize self-haul wastes. Records were obtained from the haulers and from the scalehouse to determine waste quantities for each of the characterized waste streams: residential, commercial, industrial, and self-haul.

Waste characterization data was analyzed according to categories of waste materials that included paper plastics, glass, metals, yard waste, other organics, and special wastes. These waste categories were further subdivided into types of materials within each category. Based on the results of this study, approximately 26 percent of the disposed of waste stream (including transformation/incineration) is residential, 25 percent is commercial, 23 percent is industrial, and 24 percent of the waste stream is self-hauled.

2.3 Waste Diversion Study

In compliance with AB 939, the City also conducted a waste diversion study to estimate the quantities of materials diverted from landfill through recycling, composting, and source reduction. The City's diversion study was part of a County-wide diversion study conducted for Santa Clara County by EMCON Associates in 1991. The diversion results were obtained from this study which is presented in Appendix 3. Waste diversion quantities are determined using a meterial accounting system that collected information from both the end users of diverted materials and from the collectors of those materials. When combined, the information from several sources amounted to a comprehensive and representative accounting of soild wastes diverted from the City's wastestream. Moreover, in many cases, the combined information provided a cross-check of reported quantities. Additional information on the wast diversion study is presented in Appendix 3. The study results indicate a diversion estimate total of 6.9 percent. Specific diversion programs are discussed in Sections 3 through 6 of the SRRE, and are identified in the diversion study in Appendix 3.

The only reliable information on source reduction activities was for the use of cloth diapers. Information from diaper services indicated that a total of 79.7 tons of single-use diapers were diverted from the City of Morgan Hill's wastestream in 1990 through the use of reusable cotton diapers. In total, the diaper services servicing the City of Morgan Hill reported serving 13 households, each using 50 diapers per week. Therefore, the number of

cloth diapers used per year is estimated as 138 (number of households) x 50 (number of diapers per child per week) x 52 (number of weeks in year) equals 358,800 diapers per year.

Dividing the number of diapers by 4,500 disposable diapers per ton of garbage yields an estimated 79.7 tons of garbage per year that were source reduced in the County in 1990, accounting for less than 1 percent of the total soild wastes generated. Thus, 358,800 (diapers per year) divided by 4,500 (disposable diapers per ton)[2] equals 79.7 tons per year approximately.

2.4 Materials Currently Disposed of and Diverted

Materials currently disposed of and diverted from the City are shown in Table 2-1. All wastes that are disposed are collected at the San Martin Transfer Station and landfilled at the Pacheco Pass Sanitary Landfill. The wood waste and tires that are being disposed of via transformation occurs at the Soledad Energy biomass plant in Soledad and the Oxford Energy tire-to-energy plant near Westley, California. Other materials diverted from disposal are taken to privately operated buy-back and drop-off centers, and some materials are salvaged at the landfill face.

The following table identifies the sources of waste disposal and diversion data to facilitate quantification of waste generation in future studies and for required recordkeeping.

<u>Disposal Quantities</u>	
Residential, Commercial, Industrial, and Self Haul	South Valley Refuse Disposal, Inc. (SVRD)
<u>Diversion Quantities</u>	
Residential	SVRD 20/20 Centers Drop-off Facilities
Commercial, Industrial	SVRD, Private For-Profit

[2] Lehrburger, Carl, Diapers in the Wastestream: A Review of Waste Management and Public Policy Issues, December 1988. Beavdry Communications, Washington, D.C.

	Collectors
Self-Haul	SVRD

2.5 Materials Targeted for Diversion

The following waste types identified in the DWCS as currently being disposed of are targeted for potential diversion through new, or expansions of, existing source reduction, recycling, and composting programs. This list does not imply that 100 percent of these materials can be diverted from disposal due to factors including contamination and marketability. Only those materials that can be counted towards AB 939 diversion mandates are shown.

Table 2-1 shows a landfilled amount of 28,398 tons (46,125 cubic yards).

Paper:
- corrugated containers
- mixed paper
- newspaper
- high-grade ledger paper

Metals:
- aluminum cans
- ferrous and tin cans
- non-ferrous and alum. scrap
- white goods

Yard Waste

Plastics:
- HDPE
- PET
- film plastic

Other Organics:
- tires/rubber
- wood wastes
- textiles/leather

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

Other Wastes:
- inert solids

2.6 Materials Not Targeted for Diversion

The following list of materials will continue to be disposed of in the County landfill. These materials are not targeted for diversion 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 considered as solid waste under AB 939 are shown.

Paper:

other paper

Glass:

other non-recyclable glass

Plastics:

other plastics

Special Wastes:

small household appliances

2.7 Solid Waste Generation Projections

The planning guidelines for preparing solid waste generation studies require a forecast of solid waste to be generated within the City, and that portion to be diverted and disposed of. A 15-year projection is specified following local adoption of the SRRE. Since the SRRE was due in 1991, the forecase period extends to the year 2005.

The planning guidelines specify acceptable sources of information on which to base forecasts. From the list of acceptable sources, the City elected to base projected growth in waste generation on the State Department of Finance forecast for residential population growth. The Department of Finance projects a population growth rate of 1.02 percent per year for the years 1992 - 2001 and 1.03 percent for 2002 - 2005.

Waste generation projections are presented in Tables 2-3 and 2-4. Table 2-3 presents projections of waste diverted and disposed, assuming continuation of current programs. Table 2-4 presents conservative projections assuming implementation of the programs selected by the SRRE. Actual progress toward the 25 and 50 percent grade may occur in earlier years than those listed in Table 2-4.

Table 2-1

Disposal and Diversion Quantities By Material For the Solid Waste Stream (Tons, 1990)

City of Morgan Hill

MATERIAL	DISPOSED *	DIVERTED	GENERATED	DIVERSION RATE (%)
PAPER (total)	7,611	562	8,173	7
OCC/Kraft	2,334	90	2,424	4
Magazines	367	0	367	0
Mixed Paper	1,871	0	1,871	0
Newsprint	1,111	446	1,557	29
High Grade	154	26	180	14
Other Paper	1,774	0	1,774	0
PLASTICS (total)	1,732	15	1,747	1
HDPE	156	7	163	4
PET	60	8	68	12
Film	869	0	869	0
Polystyrene Foam	95	0	95	0
Other Plastic	552	0	552	0
GLASS (total)	653	377	1,030	37
Refillable Beverage	7	103	110	94
CA Redemption Value	288	271	559	48
Other Recyclable	290	3	293	1
Other Non-Recyclable	68	0	68	0
METALS (total)	3,027	871	3,898	22
Aluminum Cans	92	98	190	52
Other Aluminum	814	0	814	0
Bi-metal Cans	27	0	27	0
Steel Food & Bev. Cans	286	0	286	0
Other Ferrous	1,690	268	1,958	14
Other Non-ferrous	5	39	44	89
White Goods	113	467	580	81
YARD WASTE (total)	5,019	80	5,099	0
OTHER ORGANICS (total)	9,563	229	9,792	2
Food	1,764	0	1,764	0
Rubber/Tires	199	2	201	1
Wood	4,199	98	4,297	2
Agri. Crop Residue	226	0	226	0
Manure	0	0	0	0
Textiles/Leather	1,014	80	1,094	7
Other Organics **	2,161	50	2,211	2
OTHER WASTES (total)	1,259	7	1,266	1
Inert Solids	1,229	0	1,229	0
Hazardous Waste	30	7	37	19
SPECIAL WASTES (total)	32	6	38	17
Small Household Appliances	32	6	38	17
TOTAL	28,896	2,148	31,044	6.9

* Includes transformation of 495.3 tons of wood wastes and 2.3 tons of tires.

** "Other Organics" includes diapers.

Table 2-2

Table 2. Average Composition (% Weight) and Annual Quantities (Tons/Year) of Disposed Waste.

Morgan Hill
April 1-7, 1991
Waste Characterization

Material	Residential N = 9 %	Residential N = 9 TPY	Commercial N = 7 %	Commercial N = 7 TPY	Industrial N = 8 %	Industrial N = 8 TPY	Self Haul (Visual) %	Self Haul (Visual) TPY	Total Disposed %	Total Disposed TPY
1) TOTAL PAPER	36.2	2723	41.9	3020	13.4	909	13.9	958	26.8	7610
OCC/Kraft	6.1	460	14.8	1068	6.1	413	5.7	393	9.2	2334
Mixed Paper	9.2	694	10.6	763	4.5	308	1.5	107	6.6	1871
Newsprint	9.9	747	3.5	253	0.6	38	1.0	72	3.9	1111
High-Grade	0.2	18	1.6	117	0.0	0	0.3	18	0.5	154
Magazines/Glossy ins.	2.7	207	2.1	149	0.0	0	0.2	12	1.3	367
Other Paper	7.9	598	9.3	670	2.2	150	5.2	358	6.2	1774
2) TOTAL PLASTICS	6.9	521	6.5	470	6.1	412	4.8	330	6.1	1732
HDPE	0.6	46	0.6	41	0.8	55	0.2	13	0.5	156
PET	0.3	25	0.1	5	0.4	30	0.0	1	0.2	50
Film	3.7	277	4.0	290	1.1	73	3.3	229	3.1	869
Polystyrene foam	0.3	20	0.5	33	0.5	34	0.1	8	0.3	95
Other Plastics	2.0	152	1.4	101	3.3	220	1.1	78	1.9	552
3) TOTAL GLASS	4.7	356	2.5	182	0.4	30	1.2	86	2.3	653
Refillable Glass Bev.	0.0	3	0.0	1	0.0	0	0.1	4	0.0	7
Calif. Redemption Value	2.4	180	1.2	88	0.2	13	0.1	7	1.0	288
Other Recyclable	2.3	172	1.3	92	0.3	17	0.1	8	1.0	290
Other Non-Recyclable	0.0	0	0.0	1	0.0	0	1.0	67	0.2	68
4) TOTAL METALS	9.8	733	5.0	363	17.9	1215	10.4	716	10.7	3027
Aluminum Cans	0.3	25	0.2	13	0.8	51	0.0	3	0.3	92
Bimetal Cans	0.0	2	0.0	0	0.0	0	0.4	25	0.1	27
Tin F&B Cans	1.4	105	0.7	51	0.6	42	1.3	87	1.0	286
Other Aluminum	5.5	410	3.0	213	2.5	178	0.2	13	2.9	814
Other Ferrous	2.5	191	1.2	85	13.9	939	6.9	474	6.0	1690
Non-Ferrous	0.0	0	0.0	0	0.1	4	0.0	0	0.0	5
White Goods	0.0	0	0.0	0	0.0	0	1.6	113	0.4	113
5) YARD WASTES	23.3	1754	17.0	1223	2.9	195	26.8	1846	17.7	5019
6) OTHER ORGANICS	17.6	1325	25.3	1820	56.1	3800	30.7	2120	31.9	9066
Food	6.7	507	15.8	1138	0.0	0	1.8	122	6.2	1764
Tires/Rubber	0.3	24	0.2	17	2.0	136	0.3	20	0.7	196
Wood	3.2	243	3.0	217	24.6	1664	22.9	1580	13.0	3704
Ag. Crop Residue	0.0	0	0.0	0	0.0	0	3.3	226	0.8	226
Manure	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Textiles/Leather	3.2	240	2.4	175	8.9	600	3.0	3	3.6	1014
Other Misc. Organics	4.2	312	3.8	276	20.7	1401	2.5	173	7.6	2162
7) OTHER WASTES	1.3	95	1.5	112	3.2	216	12.1	835	4.4	1259
Inert Solids	1.2	88	1.3	95	3.1	212	12.1	835	4.3	1229
HHW	0.1	7	0.2	17	0.1	4	0.0	1	0.1	30
8) OTHER SPECIAL WASTES a)	0.2	13	0.2	17	0.0	0	0.0	3	0.1	32
Total	100.0	7520	100.0	7208	100.0	6776	100.0	6896	100.0	28398

Average may not sum to 100% due to rounding.
a) Small Household Appliances

TPY = Tons Per Year
N = Number of Vehicles Samples

Table 2-3

15 Year Waste Generation Projections
Assuming Current Diversion Rates
City of Morgan Hill

WASTE TYPE	1991				1992			
	Disposal	Diversion	Generation	Diversion Percent	Disposal	Diversion	Generation	Diversion Percent
Paper								
OCC/Kraft	2,479	1	2,480	0.0%	775	0	775	0.0%
Magazines	382	0	382	0.0%	119	0	119	0.0%
Mixed Paper	1,908	0	1,908	0.0%	596	0	596	0.0%
Newsprint	1,585	5	1,590	0.3%	496	1	497	0.3%
High Grade	191	0	191	0.1%	60	0	60	0.1%
Other Paper	1,813	0	1,813	0.0%	567	0	567	0.0%
Subtotal	8,358	6	8,363		2,612	2	2,614	
Plastic								
HDPE	159	0	159	0.0%	50	0	50	0.0%
PET	64	0	64	0.1%	20	0	20	0.1%
Film	890	0	890	0.0%	278	0	278	0.0%
Polystyrene Foam	95	0	95	0.0%	30	0	30	0.0%
Other Plastic	572	0	572	0.0%	179	0	179	0.0%
Subtotal	1,781	0	1,781		557	0	557	
Glass								
Refillable glass	126	1	127	0.8%	39	0	40	0.8%
CA redemption value	570	3	572	0.5%	178	1	179	0.5%
Other recyclable	286	0	286	0.0%	89	0	89	0.0%
Other non-recyclable	64	0	64	0.0%	20	0	20	0.0%
Subtotal	1,046	4	1,049		327	1	328	
Metals								
Aluminum cans	190	1	191	0.5%	59	0	60	0.5%
Other Aluminum	827	0	827	0.0%	258	0	258	0.0%
Bi-metal Cans	32	0	32	0.0%	10	0	10	0.0%
Steel Food & Bev. Cans	286	0	286	0.0%	89	0	89	0.0%
Other Ferrous	2,001	3	2,003	0.1%	625	1	626	0.1%
Other Non-ferrous	31	0	32	1.3%	10	0	10	1.3%
White Goods	599	5	604	0.8%	187	1	189	0.8%
Subtotal	3,966	9	3,975		1,240	3	1,242	
Yard Waste	5,214	1	5,215	0.0%	1,630	0	1,630	0.0%
Subtotal	5,214	1	5,215		1,630	0	1,630	
Organics								
Food waste	1,813	0	1,813	0.0%	567	0	567	0.0%
Rubber/Tires	191	0	191	0.0%	60	0	60	0.0%
Wood	4,387	1	4,388	0.0%	1,371	0	1,372	0.0%
Agri. Crop Residue	223	0	223	0.0%	70	0	70	0.0%
Manure	0	0	0	0.0%	0	0	0	0.0%
Textiles/leather	1,112	1	1,113	0.1%	348	0	348	0.1%
Other organics	2,257	1	2,258	0.0%	706	0	706	0.0%
Subtotal	9,983	2	9,985		3,120	1	3,121	
Other Wastes								
Inert solids	1,272	0	1,272	0.0%	398	0	398	0.0%
Hazardous waste	32	0	32	0.2%	10	0	10	0.2%
Subtotal	1,304	0	1,304		408	0	408	
Total Other Wastes								
Appliances	32	0	32	0.2%	10	0	10	0.2%
Subtotal	32	0	32		10	0	10	
Total Waste *	29,600	2,200	31,800	6.9%	9,300	700	9,900	6.9%

* Rounded to the nearest 100 tons

Table 2-3 cont'd

15 Year Waste Generation Projections
Assuming Current Diversion Rates
City of Morgan Hill

WASTE TYPE	1993				1994			
	Disposal	Diversion	Generation	Diversion Percent	Disposal	Diversion	Generation	Diversion Percent
Paper								
OCC/Kraft	787	0	788	0.0%	800	0	800	0.0%
Magazines	121	0	121	0.0%	123	0	123	0.0%
Mixed Paper	606	0	606	0.0%	616	0	616	0.0%
Newsprint	503	1	505	0.3%	512	1	513	0.3%
High Grade	61	0	61	0.1%	61	0	62	0.1%
Other Paper	576	0	576	0.0%	585	0	585	0.0%
Subtotal	2,654	2	2,656		2,697	2	2,699	
Plastic								
HDPE	50	0	50	0.0%	51	0	51	0.0%
PET	20	0	20	0.1%	20	0	21	0.1%
Film	283	0	283	0.0%	287	0	287	0.0%
Polystyrene Foam	30	0	30	0.0%	31	0	31	0.0%
Other Plastic	182	0	182	0.0%	185	0	185	0.0%
Subtotal	565	0	566		575	0	575	
Glass								
Refillable glass	40	0	40	0.8%	41	0	41	0.8%
CA redemption value	181	1	182	0.5%	184	1	185	0.5%
Other recyclable	91	0	91	0.0%	92	0	92	0.0%
Other non-recyclable	20	0	20	0.0%	21	0	21	0.0%
Subtotal	332	1	333		337	1	339	
Metals								
Aluminum cans	60	0	61	0.5%	61	0	62	0.5%
Other Aluminum	263	0	263	0.0%	267	0	267	0.0%
Bi-metal Cans	10	0	10	0.0%	10	0	10	0.0%
Steel Food & Bev. Cans	91	0	91	0.0%	92	0	92	0.0%
Other Ferrous	635	1	636	0.1%	646	1	646	0.1%
Other Non-ferrous	10	0	10	1.3%	10	0	10	1.3%
White Goods	190	2	192	0.8%	193	2	195	0.8%
Subtotal	1,260	3	1,262		1,280	3	1,283	
Leaves and Grass	1,656	0	1,656	0.0%	1,682	0	1,683	0.0%
Subtotal	1,656	0	1,656		1,682	0	1,683	
Organics								
Food waste	576	0	576	0.0%	585	0	585	0.0%
Rubber/Tires	61	0	61	0.0%	62	0	62	0.0%
Wood	1,393	0	1,394	0.0%	1,416	0	1,416	0.0%
Agri. Crop Residue	71	0	71	0.0%	72	0	72	0.0%
Manure	0	0	0	0.0%	0	0	0	0.0%
Textiles/leather	353	0	353	0.1%	359	0	359	0.1%
Other organics	717	0	717	0.0%	728	0	728	0.0%
Subtotal	3,170	1	3,171		3,221	1	3,222	
Other Wastes								
Inert solids	404	0	404	0.0%	410	0	410	0.0%
Hazardous waste	10	0	10	0.2%	10	0	10	0.2%
Subtotal	414	0	414		421	0	421	
Total Other Wastes								
Appliances	10	0	10	0.2%	10	0	10	0.2%
Subtotal	10	0	10		10	0	10	
Total Waste *	9,400	700	10,100	6.9%	9,600	700	10,300	6.9%

* Rounded to the nearest 100 tons

Table 2-3 cont'd

15 Year Waste Generation Projections
Assuming Current Diversion Rates
City of Morgan Hill

WASTE TYPE	1995				1996			
	Disposal	Diversion	Generation	Diversion Percent	Disposal	Diversion	Generation	Diversion Percent
Paper								
OCC/Kraft	813	0	813	0.0%	826	0	826	0.0%
Magazines	125	0	125	0.0%	127	0	127	0.0%
Mixed Paper	625	0	625	0.0%	635	0	635	0.0%
Newsprint	520	1	521	0.3%	528	2	530	0.3%
High Grade	62	0	63	0.1%	63	0	64	0.1%
Other Paper	594	0	594	0.0%	604	0	604	0.0%
Subtotal	2,740	2	2,742		2,784	2	2,786	
Plastic								
HDPE	52	0	52	0.0%	53	0	53	0.0%
PET	21	0	21	0.1%	21	0	21	0.1%
Film	292	0	292	0.0%	297	0	297	0.0%
Polystyrene Foam	31	0	31	0.0%	32	0	32	0.0%
Other Plastic	188	0	188	0.0%	191	0	191	0.0%
Subtotal	584	0	584		593	0	593	
Glass								
Refillable glass	41	0	42	0.8%	42	0	42	0.8%
CA redemption value	187	1	188	0.5%	190	1	191	0.5%
Other recyclable	94	0	94	0.0%	95	0	95	0.0%
Other non-recyclable	21	0	21	0.0%	21	0	21	0.0%
Subtotal	343	1	344		348	1	350	
Metals								
Aluminum cans	62	0	63	0.5%	63	0	64	0.5%
Other Aluminum	271	0	271	0.0%	275	0	275	0.0%
Bi-metal Cans	10	0	10	0.0%	11	0	11	0.0%
Steel Food & Bev. Cans	94	0	94	0.0%	95	0	95	0.0%
Other Ferrous	656	1	657	0.1%	666	1	667	0.1%
Other Non-ferrous	10	0	10	1.3%	10	0	11	1.3%
White Goods	197	2	198	0.8%	200	2	201	0.8%
Subtotal	1,300	3	1,303		1,321	3	1,324	
Leaves and Grass	1,709	0	1,710	0.0%	1,737	0	1,737	0.0%
Subtotal	1,709	0	1,710		1,737	0	1,737	
Organics								
Food waste	594	0	594	0.0%	604	0	604	0.0%
Rubber/Tires	63	0	63	0.0%	64	0	64	0.0%
Wood	1,438	0	1,439	0.0%	1,461	0	1,462	0.0%
Agri. Crop Residue	73	0	73	0.0%	74	0	74	0.0%
Manure	0	0	0	0.0%	0	0	0	0.0%
Textiles/leather	365	0	365	0.1%	370	0	371	0.1%
Other organics	740	0	740	0.0%	752	0	752	0.0%
Subtotal	3,273	1	3,273		3,325	1	3,326	
Other Wastes								
Inert solids	417	0	417	0.0%	424	0	424	0.0%
Hazardous waste	10	0	10	0.2%	11	0	11	0.2%
Subtotal	427	0	427		434	0	434	
Total Other Wastes								
Appliances	10	0	10	0.2%	11	0	11	0.2%
Subtotal	10	0	10		11	0	11	
Total Waste *	9,700	700	10,400	6.9%	9,900	700	10,600	6.9%

* Rounded to the nearest 100 tons

Table 2-3 cont'd

15 Year Waste Generation Projections
Assuming Current Diversion Rates
City of Morgan Hill

WASTE TYPE	1997				1998			
	Disposal	Diversion	Generation	Diversion Percent	Disposal	Diversion	Generation	Diversion Percent
Paper								
OCC/Kraft	839	0	839	0.0%	852	0	853	0.0%
Magazines	129	0	129	0.0%	131	0	131	0.0%
Mixed Paper	646	0	646	0.0%	656	0	656	0.0%
Newsprint	537	2	538	0.3%	545	2	547	0.3%
High Grade	64	0	65	0.1%	66	0	66	0.1%
Other Paper	613	0	613	0.0%	623	0	623	0.0%
Subtotal	2,828	2	2,830		2,873	2	2,875	
Plastic								
HDPE	54	0	54	0.0%	55	0	55	0.0%
PET	21	0	22	0.1%	22	0	22	0.1%
Film	301	0	301	0.0%	306	0	306	0.0%
Polystyrene Foam	32	0	32	0.0%	33	0	33	0.0%
Other Plastic	194	0	194	0.0%	197	0	197	0.0%
Subtotal	603	0	603		612	0	612	
Glass								
Refillable glass	43	0	43	0.8%	43	0	44	0.8%
CA redemption value	193	1	194	0.5%	196	1	197	0.5%
Other recyclable	97	0	97	0.0%	98	0	98	0.0%
Other non-recyclable	22	0	22	0.0%	22	0	22	0.0%
Subtotal	354	1	355		359	1	361	
Metals								
Aluminum cans	64	0	65	0.5%	65	0	66	0.5%
Other Aluminum	280	0	280	0.0%	284	0	284	0.0%
Bi-metal Cans	11	0	11	0.0%	11	0	11	0.0%
Steel Food & Bev. Cans	97	0	97	0.0%	98	0	98	0.0%
Other Ferrous	677	1	678	0.1%	688	1	689	0.1%
Other Non-ferrous	11	0	11	1.3%	11	0	11	1.3%
White Goods	203	2	204	0.8%	206	2	208	0.8%
Subtotal	1,342	3	1,345		1,364	3	1,367	
Leaves and Grass	1,765	0	1,765	0.0%	1,793	0	1,793	0.0%
Subtotal	1,765	0	1,765		1,793	0	1,793	
Organics								
Food waste	613	0	613	0.0%	623	0	623	0.0%
Rubber/Tires	65	0	65	0.0%	66	0	66	0.0%
Wood	1,485	0	1,485	0.0%	1,508	0	1,509	0.0%
Agri. Crop Residue	75	0	75	0.0%	77	0	77	0.0%
Manure	0	0	0	0.0%	0	0	0	0.0%
Textiles/leather	376	0	377	0.1%	382	0	383	0.1%
Other organics	764	0	764	0.0%	776	0	776	0.0%
Subtotal	3,378	1	3,379		3,432	1	3,433	
Other Wastes								
Inert solids	430	0	430	0.0%	437	0	437	0.0%
Hazardous waste	11	0	11	0.2%	11	0	11	0.2%
Subtotal	441	0	441		448	0	448	
Total Other Wastes								
Appliances	11	0	11	0.2%	11	0	11	0.2%
Subtotal	11	0	11		11	0	11	
Total Waste *	10,000	700	10,800	6.9%	10,200	800	10,900	6.9%

* Rounded to the nearest 100 tons

Table 2-3 cont'd

15 Year Waste Generation Projections
Assuming Current Diversion Rates
City of Morgan Hill

WASTE TYPE	1999				2000			
	Disposal	Diversion	Generation	Diversion Percent	Disposal	Diversion	Generation	Diversion Percent
Paper								
OCC/Kraft	866	0	866	0.0%	880	0	880	0.0%
Magazines	133	0	133	0.0%	135	0	135	0.0%
Mixed Paper	666	0	666	0.0%	677	0	677	0.0%
Newsprint	554	2	555	0.3%	563	2	564	0.3%
High Grade	67	0	67	0.1%	68	0	68	0.1%
Other Paper	633	0	633	0.0%	643	0	643	0.0%
Subtotal	2,919	2	2,921		2,966	2	2,968	
Plastic								
HDPE	56	0	56	0.0%	56	0	56	0.0%
PET	22	0	22	0.1%	23	0	23	0.1%
Film	311	0	311	0.0%	316	0	316	0.0%
Polystyrene Foam	33	0	33	0.0%	34	0	34	0.0%
Other Plastic	200	0	200	0.0%	203	0	203	0.0%
Subtotal	622	0	622		632	0	632	
Glass								
Refillable glass	44	0	44	0.8%	45	0	45	0.8%
CA redemption value	199	1	200	0.5%	202	1	203	0.5%
Other recyclable	100	0	100	0.0%	102	0	102	0.0%
Other non-recyclable	22	0	22	0.0%	23	0	23	0.0%
Subtotal	365	1	367		371	1	372	
Metals								
Aluminum cans	66	0	67	0.5%	67	0	68	0.5%
Other Aluminum	289	0	289	0.0%	293	0	293	0.0%
Bi-metal Cans	11	0	11	0.0%	11	0	11	0.0%
Steel Food & Bev. Cans	100	0	100	0.0%	102	0	102	0.0%
Other Ferrous	699	1	700	0.1%	710	1	711	0.1%
Other Non-ferrous	11	0	11	1.3%	11	0	11	1.3%
White Goods	209	2	211	0.8%	213	2	214	0.8%
Subtotal	1,385	3	1,389		1,408	3	1,411	
Leaves and Grass	1,821	0	1,822	0.0%	1,851	0	1,851	0.0%
Subtotal	1,821	0	1,822		1,851	0	1,851	
Organics								
Food waste	633	0	633	0.0%	643	0	643	0.0%
Rubber/Tires	67	0	67	0.0%	68	0	68	0.0%
Wood	1,533	0	1,533	0.0%	1,557	0	1,557	0.0%
Agri. Crop Residue	78	0	78	0.0%	79	0	79	0.0%
Manure	0	0	0	0.0%	0	0	0	0.0%
Textiles/leather	388	0	389	0.1%	395	0	395	0.1%
Other organics	788	0	789	0.0%	801	0	801	0.0%
Subtotal	3,487	1	3,488		3,543	1	3,544	
Other Wastes								
Inert solids	444	0	444	0.0%	451	0	451	0.0%
Hazardous waste	11	0	11	0.2%	11	0	11	0.2%
Subtotal	455	0	455		463	0	463	
Total Other Wastes								
Appliances	11	0	11	0.2%	11	0	11	0.2%
Subtotal	11	0	11		11	0	11	
Total Waste *	10,300	800	11,100	6.9%	10,500	800	11,300	6.9%

* Rounded to the nearest 100 tons

Table 2-3 cont'd

15 Year Waste Generation Projections
Assuming Current Diversion Rates
City of Morgan Hill

WASTE TYPE	2001				2002			
	Disposal	Diversion	Generation	Diversion Percent	Disposal	Diversion	Generation	Diversion Percent
Paper								
OCC/Kraft	894	0	894	0.0%	908	0	909	0.0%
Magazines	138	0	138	0.0%	140	0	140	0.0%
Mixed Paper	688	0	688	0.0%	699	0	699	0.0%
Newsprint	572	2	573	0.3%	581	2	582	0.3%
High Grade	69	0	69	0.1%	70	0	70	0.1%
Other Paper	654	0	654	0.0%	664	0	664	0.0%
Subtotal	3,014	2	3,016		3,062	2	3,064	
Plastic								
HDPE	57	0	57	0.0%	58	0	58	0.0%
PET	23	0	23	0.1%	23	0	23	0.1%
Film	321	0	321	0.0%	326	0	326	0.0%
Polystyrene Foam	34	0	34	0.0%	35	0	35	0.0%
Other Plastic	206	0	206	0.0%	210	0	210	0.0%
Subtotal	642	0	642		652	0	652	
Glass								
Refillable glass	45	0	46	0.8%	46	0	47	0.8%
CA redemption value	205	1	206	0.5%	209	1	210	0.5%
Other recyclable	103	0	103	0.0%	105	0	105	0.0%
Other non-recyclable	23	0	23	0.0%	23	0	23	0.0%
Subtotal	377	1	378		383	1	384	
Metals								
Aluminum cans	68	0	69	0.5%	70	0	70	0.5%
Other Aluminum	298	0	298	0.0%	303	0	303	0.0%
Bi-metal Cans	11	0	11	0.0%	12	0	12	0.0%
Steel Food & Bev. Cans	103	0	103	0.0%	105	0	105	0.0%
Other Ferrous	721	1	722	0.1%	733	1	734	0.1%
Other Non-ferrous	11	0	11	1.3%	12	0	12	1.3%
White Goods	216	2	218	0.8%	220	2	221	0.8%
Subtotal	1,430	3	1,433		1,453	3	1,456	
Leaves and Grass	1,880	0	1,880	0.0%	1,910	0	1,911	0.0%
Subtotal	1,880	0	1,880		1,910	0	1,911	
Organics								
Food waste	654	0	654	0.0%	664	0	664	0.0%
Rubber/Tires	69	0	69	0.0%	70	0	70	0.0%
Wood	1,582	0	1,582	0.0%	1,607	0	1,608	0.0%
Agri. Crop Residue	80	0	80	0.0%	82	0	82	0.0%
Manure	0	0	0	0.0%	0	0	0	0.0%
Textiles/leather	401	0	401	0.1%	407	0	408	0.1%
Other organics	814	0	814	0.0%	827	0	827	0.0%
Subtotal	3,600	1	3,600		3,657	1	3,658	
Other Wastes								
Inert solids	459	0	459	0.0%	466	0	466	0.0%
Hazardous waste	11	0	11	0.2%	12	0	12	0.2%
Subtotal	470	0	470		478	0	478	
Total Other Wastes								
Appliances	11	0	11	0.2%	12	0	12	0.2%
Subtotal	11	0	11		12	0	12	
Total Waste *	10,700	800	11,500	6.9%	10,800	800	11,600	6.9%

* Rounded to the nearest 100 tons

Table 2-3 cont'd

15 Year Waste Generation Projections
Assuming Current Diversion Rates
City of Morgan Hill

WASTE TYPE	2003				2004			
	Disposal	Diversion	Generation	Diversion Percent	Disposal	Diversion	Generation	Diversion Percent
Paper								
OCC/Kraft	923	0	923	0.0%	938	0	938	0.0%
Magazines	142	0	142	0.0%	144	0	144	0.0%
Mixed Paper	710	0	710	0.0%	722	0	722	0.0%
Newsprint	590	2	592	0.3%	600	2	601	0.3%
High Grade	71	0	71	0.1%	72	0	72	0.1%
Other Paper	675	0	675	0.0%	685	0	685	0.0%
Subtotal	3,111	2	3,113		3,161	2	3,163	
Plastic								
HDPE	59	0	59	0.0%	60	0	60	0.0%
PET	24	0	24	0.1%	24	0	24	0.1%
Film	331	0	331	0.0%	337	0	337	0.0%
Polystyrene Foam	36	0	36	0.0%	36	0	36	0.0%
Other Plastic	213	0	213	0.0%	216	0	216	0.0%
Subtotal	663	0	663		673	0	673	
Glass								
Refillable glass	47	0	47	0.8%	48	0	48	0.8%
CA redemption value	212	1	213	0.5%	215	1	216	0.5%
Other recyclable	107	0	107	0.0%	108	0	108	0.0%
Other non-recyclable	24	0	24	0.0%	24	0	24	0.0%
Subtotal	389	1	391		395	1	397	
Metals								
Aluminum cans	71	0	71	0.5%	72	0	72	0.5%
Other Aluminum	308	0	308	0.0%	313	0	313	0.0%
Bi-metal Cans	12	0	12	0.0%	12	0	12	0.0%
Steel Food & Bev. Cans	107	0	107	0.0%	108	0	108	0.0%
Other Ferrous	745	1	746	0.1%	757	1	758	0.1%
Other Non-ferrous	12	0	12	1.3%	12	0	12	1.3%
White Goods	223	2	225	0.8%	227	2	228	0.8%
Subtotal	1,476	3	1,480		1,500	3	1,503	
Leaves and Grass	1,941	0	1,941	0.0%	1,972	0	1,972	0.0%
Subtotal	1,941	0	1,941		1,972	0	1,972	
Organics								
Food waste	675	0	675	0.0%	685	0	685	0.0%
Rubber/Tires	71	0	71	0.0%	72	0	72	0.0%
Wood	1,633	0	1,633	0.0%	1,659	0	1,660	0.0%
Agri. Crop Residue	83	0	83	0.0%	84	0	84	0.0%
Manure	0	0	0	0.0%	0	0	0	0.0%
Textiles/leather	414	0	414	0.1%	421	0	421	0.1%
Other organics	840	0	840	0.0%	854	0	854	0.0%
Subtotal	3,716	1	3,717		3,775	1	3,776	
Other Wastes								
Inert solids	473	0	473	0.0%	481	0	481	0.0%
Hazardous waste	12	0	12	0.2%	12	0	12	0.2%
Subtotal	485	0	485		493	0	493	
Total Other Wastes								
Appliances	12	0	12	0.2%	12	0	12	0.2%
Subtotal	12	0	12		12	0	12	
Total Waste *	11,000	800	11,800	6.9%	11,200	800	12,000	6.9%

* Rounded to the nearest 100 tons

Table 2-3 cont'd

15 Year Waste Generation Projections
Assuming Current Diversion Rates
City of Morgan Hill

WASTE TYPE	2005			
	Disposal	Diversion	Generation	Diversion Percent
Paper				
OCC/Kraft	953	0	953	0.0%
Magazines	147	0	147	0.0%
Mixed Paper	733	0	733	0.0%
Newsprint	609	2	611	0.3%
High Grade	73	0	73	0.1%
Other Paper	696	0	696	0.0%
Subtotal	3,211	2	3,213	
Plastic				
HDPE	61	0	61	0.0%
PET	24	0	24	0.1%
Film	342	0	342	0.0%
Polystyrene Foam	37	0	37	0.0%
Other Plastic	220	0	220	0.0%
Subtotal	684	0	684	
Glass				
Refillable glass	48	0	49	0.8%
CA redemption value	219	1	220	0.5%
Other recyclable	110	0	110	0.0%
Other non-recyclable	24	0	24	0.0%
Subtotal	402	1	403	
Metals				
Aluminum cans	73	0	73	0.5%
Other Aluminum	318	0	318	0.0%
Bi-metal Cans	12	0	12	0.0%
Steel Food & Bev. Cans	110	0	110	0.0%
Other Ferrous	769	1	770	0.1%
Other Non-ferrous	12	0	12	1.3%
White Goods	230	2	232	0.8%
Subtotal	1,524	3	1,527	
Leaves and Grass	2,003	0	2,004	0.0%
Subtotal	2,003	0	2,004	
Organics				
Food waste	696	0	696	0.0%
Rubber/Tires	73	0	73	0.0%
Wood	1,686	0	1,686	0.0%
Agri. Crop Residue	86	0	86	0.0%
Manure	0	0	0	0.0%
Textiles/leather	427	0	428	0.1%
Other organics	867	0	867	0.0%
Subtotal	3,836	1	3,836	
Other Wastes				
Inert solids	489	0	489	0.0%
Hazardous waste	12	0	12	0.2%
Subtotal	501	0	501	
Total Other Wastes				
Appliances	12	0	12	0.2%
Subtotal	12	0	12	
Total Waste *	11,400	800	12,200	6.9%

* Rounded to the nearest 100 tons

Table 2-4

15 Year Waste Generation Projections
Assuming AB 939 Diversion Rates
City of Morgan Hill

WASTE TYPE	1991				1992			
	Disposal	Diversion	Generation	Diversion Percent	Disposal	Diversion	Generation	Diversion Percent
Paper								
OCC/Kraft	2,479	1	2,480	0.0%	775	0	775	0.0%
Magazines	382	0	382	0.0%	119	0	119	0.0%
Mixed Paper	1,908	0	1,908	0.0%	596	0	596	0.0%
Newsprint	1,585	5	1,590	0.3%	496	1	497	0.3%
High Grade	191	0	191	0.1%	60	0	60	0.1%
Other Paper	1,813	0	1,813	0.0%	567	0	567	0.0%
Subtotal	8,358	6	8,363		2,612	2	2,614	
Plastic								
HDPE	159	0	159	0.0%	50	0	50	0.0%
PET	64	0	64	0.1%	20	0	20	0.1%
Film	890	0	890	0.0%	278	0	278	0.0%
Polystyrene Foam	95	0	95	0.0%	30	0	30	0.0%
Other Plastic	572	0	572	0.0%	179	0	179	0.0%
Subtotal	1,781	0	1,781		557	0	557	
Glass								
Refillable glass	126	1	127	0.8%	39	0	40	0.8%
CA redemption value	570	3	572	0.5%	178	1	179	0.5%
Other recyclable	286	0	286	0.0%	89	0	89	0.0%
Other non-recyclable	64	0	64	0.0%	20	0	20	0.0%
Subtotal	1,046	4	1,049		327	1	328	
Metals								
Aluminum cans	190	1	191	0.5%	59	0	60	0.5%
Other Aluminum	827	0	827	0.0%	258	0	258	0.0%
Bi-metal Cans	32	0	32	0.0%	10	0	10	0.0%
Steel Food & Bev. Cans	286	0	286	0.0%	89	0	89	0.0%
Other Ferrous	2,001	3	2,003	0.1%	625	1	626	0.1%
Other Non-ferrous	31	0	32	1.3%	10	0	10	1.3%
White Goods	599	5	604	0.8%	187	1	189	0.8%
Subtotal	3,966	9	3,975		1,240	3	1,242	
Yard Waste	5,214	1	5,215	0.0%	1,630	0	1,630	0.0%
Subtotal	5,214	1	5,215		1,630	0	1,630	
Organics								
Food waste	1,813	0	1,813	0.0%	567	0	567	0.0%
Rubber/Tires	191	0	191	0.0%	60	0	60	0.0%
Wood	4,387	1	4,388	0.0%	1,371	0	1,372	0.0%
Agri. Crop Residue	223	0	223	0.0%	70	0	70	0.0%
Manure	0	0	0	0.0%	0	0	0	0.0%
Textiles/leather	1,112	1	1,113	0.1%	348	0	348	0.1%
Other organics	2,257	1	2,258	0.0%	706	0	706	0.0%
Subtotal	9,983	2	9,985		3,120	1	3,121	
Other Wastes								
Inert solids	1,272	0	1,272	0.0%	398	0	398	0.0%
Hazardous waste	32	0	32	0.2%	10	0	10	0.2%
Subtotal	1,304	0	1,304		408	0	408	
Total Other Wastes								
Appliances	32	0	32	0.2%	10	0	10	0.2%
Subtotal	32	0	32		10	0	10	
Total Waste *	29,600	2,200	31,800	6.9%	9,300	700	9,900	6.9%

* Rounded to the nearest 100 tons. Projections are based on achieving 25% diversion in 1995, and 50% diversion in 2000, although programs (identified in the SRRE) will likely begin intermittently during the planning periods.

Table 2-4 cont'd

15 Year Waste Generation Projections
Assuming AB 939 Diversion Rates
City of Morgan Hill

WASTE TYPE	1993				1994			
	Disposal	Diversion	Generation	Diversion Percent	Disposal	Diversion	Generation	Diversion Percent
Paper								
OCC/Kraft	787	0	788	0.0%	800	0	800	0.0%
Magazines	121	0	121	0.0%	123	0	123	0.0%
Mixed Paper	606	0	606	0.0%	616	0	616	0.0%
Newsprint	503	1	505	0.3%	512	1	513	0.3%
High Grade	61	0	61	0.1%	61	0	62	0.1%
Other Paper	576	0	576	0.0%	585	0	585	0.0%
Subtotal	2,654	2	2,656		2,697	2	2,699	
Plastic								
HDPE	50	0	50	0.0%	51	0	51	0.0%
PET	20	0	20	0.1%	20	0	21	0.1%
Film	283	0	283	0.0%	287	0	287	0.0%
Polystyrene Foam	30	0	30	0.0%	31	0	31	0.0%
Other Plastic	182	0	182	0.0%	185	0	185	0.0%
Subtotal	565	0	566		575	0	575	
Glass								
Refillable glass	40	0	40	0.8%	41	0	41	0.8%
CA redemption value	181	1	182	0.5%	184	1	185	0.5%
Other recyclable	91	0	91	0.0%	92	0	92	0.0%
Other non-recyclable	20	0	20	0.0%	21	0	21	0.0%
Subtotal	332	1	333		337	1	339	
Metals								
Aluminum cans	60	0	61	0.5%	61	0	62	0.5%
Other Aluminum	263	0	263	0.0%	267	0	267	0.0%
Bi-metal Cans	10	0	10	0.0%	10	0	10	0.0%
Steel Food & Bev. Cans	91	0	91	0.0%	92	0	92	0.0%
Other Ferrous	635	1	636	0.1%	646	1	646	0.1%
Other Non-ferrous	10	0	10	1.3%	10	0	10	1.3%
White Goods	190	2	192	0.8%	193	2	195	0.8%
Subtotal	1,260	3	1,262		1,280	3	1,283	
Leaves and Grass	1,656	0	1,656	0.0%	1,682	0	1,683	0.0%
Subtotal	1,656	0	1,656		1,682	0	1,683	
Organics								
Food waste	576	0	576	0.0%	585	0	585	0.0%
Rubber/Tires	61	0	61	0.0%	62	0	62	0.0%
Wood	1,393	0	1,394	0.0%	1,416	0	1,416	0.0%
Agri. Crop Residue	71	0	71	0.0%	72	0	72	0.0%
Manure	0	0	0	0.0%	0	0	0	0.0%
Textiles/leather	353	0	353	0.1%	359	0	359	0.1%
Other organics	717	0	717	0.0%	728	0	728	0.0%
Subtotal	3,170	1	3,171		3,221	1	3,222	
Other Wastes								
Inert solids	404	0	404	0.0%	410	0	410	0.0%
Hazardous waste	10	0	10	0.2%	10	0	10	0.2%
Subtotal	414	0	414		421	0	421	
Total Other Wastes								
Appliances	10	0	10	0.2%	10	0	10	0.2%
Subtotal	10	0	10		10	0	10	
Total Waste *	9,400	700	10,100	6.9%	9,600	700	10,300	6.9%

* Rounded to the nearest 100 tons. Projections are based on achieving 25% diversion in 1995, and 50% diversion in 2000, although programs (identified in the SRRE) will likely begin intermittently during the planning periods.

Table 2-4 cont'd

15 Year Waste Generation Projections
Assuming AB 939 Diversion Rates
City of Morgan Hill

WASTE TYPE	1995				1996			
	Disposal	Diversion	Generation	Diversion Percent	Disposal	Diversion	Generation	Diversion Percent
Paper								
OCC/Kraft	471	342	813	42.0%	479	347	826	42.0%
Magazines	125	0	125	0.0%	127	0	127	0.0%
Mixed Paper	625	0	625	0.0%	635	0	635	0.0%
Newsprint	301	220	521	42.3%	306	224	530	42.3%
High Grade	62	0	63	0.1%	63	0	64	0.1%
Other Paper	594	0	594	0.0%	604	0	604	0.0%
Subtotal	2,179	562	2,742		2,214	571	2,786	
Plastic								
HDPE	30	22	52	42.0%	31	22	53	42.0%
PET	12	9	21	42.1%	12	9	21	42.1%
Film	292	0	292	0.0%	297	0	297	0.0%
Polystyrene Foam	18	13	31	42.0%	18	13	32	42.0%
Other Plastic	188	0	188	0.0%	191	0	191	0.0%
Subtotal	540	44	584		549	45	593	
Glass								
Refillable glass	41	0	42	0.8%	42	0	42	0.8%
CA redemption value	108	80	188	42.5%	110	81	191	42.5%
Other recyclable	54	39	94	42.0%	55	40	95	42.0%
Other non-recyclable	21	0	21	0.0%	21	0	21	0.0%
Subtotal	225	119	344		228	121	350	
Metals								
Aluminum cans	36	27	63	42.5%	37	27	64	42.5%
Other Aluminum	271	0	271	0.0%	275	0	275	0.0%
Bi-metal Cans	10	0	10	0.0%	11	0	11	0.0%
Steel Food & Bev. Cans	54	39	94	42.0%	55	40	95	42.0%
Other Ferrous	380	277	657	42.1%	386	281	667	42.1%
Other Non-ferrous	6	5	10	43.3%	6	5	11	43.3%
White Goods	197	2	198	0.8%	200	2	201	0.8%
Subtotal	954	349	1,303		970	354	1,324	
Leaves and Grass	991	718	1,710	42.0%	1,007	730	1,737	42.0%
Subtotal	991	718	1,710		1,007	730	1,737	
Organics								
Food waste	594	0	594	0.0%	604	0	604	0.0%
Rubber/Tires	36	26	63	42.0%	37	27	64	42.0%
Wood	834	605	1,439	42.0%	847	614	1,462	42.0%
Agri. Crop Residue	73	0	73	0.0%	74	0	74	0.0%
Manure	0	0	0	0.0%	0	0	0	0.0%
Textiles/leather	365	0	365	0.1%	370	0	371	0.1%
Other organics	740	0	740	0.0%	752	0	752	0.0%
Subtotal	2,642	631	3,273		2,684	641	3,326	
Other Wastes								
Inert solids	242	175	417	42.0%	246	178	424	42.0%
Hazardous waste	10	0	10	0.2%	11	0	11	0.2%
Subtotal	252	175	427		256	178	434	
Total Other Wastes								
Appliances	10	0	10	0.2%	11	0	11	0.2%
Subtotal	10	0	10		11	0	11	
Total Waste *	7,800	2,600	10,400	25.0%	7,900	2,600	10,600	25.0%

* Rounded to the nearest 100 tons. Projections are based on achieving 25% diversion in 1995, and 50% diversion in 2000, although programs (identified in the SRRE) will likely begin intermittently during the planning periods.

Table 2-4 cont'd

15 Year Waste Generation Projections
Assuming AB 939 Diversion Rates
City of Morgan Hill

WASTE TYPE	1997				1998			
	Disposal	Diversion	Generation	Diversion Percent	Disposal	Diversion	Generation	Diversion Percent
Paper								
OCC/Kraft	487	353	839	42.0%	494	358	853	42.0%
Magazines	129	0	129	0.0%	131	0	131	0.0%
Mixed Paper	646	0	646	0.0%	656	0	656	0.0%
Newsprint	311	228	538	42.3%	315	231	547	42.3%
High Grade	64	0	65	0.1%	66	0	66	0.1%
Other Paper	613	0	613	0.0%	623	0	623	0.0%
Subtotal	2,250	580	2,830		2,286	590	2,875	
Plastic								
HDPE	31	23	54	42.0%	32	23	55	42.0%
PET	12	9	22	42.1%	13	9	22	42.1%
Film	301	0	301	0.0%	306	0	306	0.0%
Polystyrene Foam	19	14	32	42.0%	19	14	33	42.0%
Other Plastic	194	0	194	0.0%	197	0	197	0.0%
Subtotal	557	45	603		566	46	612	
Glass								
Refillable glass	43	0	43	0.8%	43	0	44	0.8%
CA redemption value	111	82	194	42.5%	113	84	197	42.5%
Other recyclable	56	41	97	42.0%	57	41	98	42.0%
Other non-recyclable	22	0	22	0.0%	22	0	22	0.0%
Subtotal	232	123	355		235	125	361	
Metals								
Aluminum cans	37	27	65	42.5%	38	28	66	42.5%
Other Aluminum	280	0	280	0.0%	284	0	284	0.0%
Bi-metal Cans	11	0	11	0.0%	11	0	11	0.0%
Steel Food & Bev. Cans	56	41	97	42.0%	57	41	98	42.0%
Other Ferrous	392	286	678	42.1%	399	290	689	42.1%
Other Non-ferrous	6	5	11	43.3%	6	5	11	43.3%
White Goods	203	2	204	0.8%	206	2	208	0.8%
Subtotal	985	360	1,345		1,001	366	1,367	
Leaves and Grass	1,023	741	1,765	42.0%	1,040	753	1,793	42.0%
Subtotal	1,023	741	1,765		1,040	753	1,793	
Organics								
Food waste	613	0	613	0.0%	623	0	623	0.0%
Rubber/Tires	37	27	65	42.0%	38	28	66	42.0%
Wood	861	624	1,485	42.0%	875	634	1,509	42.0%
Agn. Crop Residue	75	0	75	0.0%	77	0	77	0.0%
Manure	0	0	0	0.0%	0	0	0	0.0%
Textiles/leather	376	0	377	0.1%	382	0	383	0.1%
Other organics	764	0	764	0.0%	776	0	776	0.0%
Subtotal	2,727	652	3,379		2,771	662	3,433	
Other Wastes								
Inert solids	250	181	430	42.0%	254	184	437	42.0%
Hazardous waste	11	0	11	0.2%	11	0	11	0.2%
Subtotal	260	181	441		265	184	448	
Total Other Wastes								
Appliances	11	0	11	0.2%	11	0	11	0.2%
Subtotal	11	0	11		11	0	11	
Total Waste *	8,100	2,700	10,800	25.0%	8,200	2,700	10,900	25.0%

* Rounded to the nearest 100 tons. Projections are based on achieving 25% diversion in 1995, and 50% diversion in 2000, although programs (identified in the SRRE) will likely begin intermittently during the planning periods.

Table 2-4 cont'd

15 Year Waste Generation Projections
Assuming AB 939 Diversion Rates
City of Morgan Hill

WASTE TYPE	1999				2000			
	Disposal	Diversion	Generation	Diversion Percent	Disposal	Diversion	Generation	Diversion Percent
Paper								
OCC/Kraft	502	364	866	42.0%	226	654	880	74.3%
Magazines	133	0	133	0.0%	92	44	135	32.3%
Mixed Paper	666	0	666	0.0%	458	219	677	32.3%
Newsprint	321	235	555	42.3%	143	421	564	74.6%
High Grade	67	0	67	0.1%	46	22	68	32.4%
Other Paper	633	0	633	0.0%	643	0	643	0.0%
Subtotal	2,322	599	2,921		1,608	1,360	2,968	
Plastic								
HDPE	32	23	56	42.0%	14	42	56	74.3%
PET	13	9	22	42.1%	6	17	23	74.4%
Film	311	0	311	0.0%	214	102	316	32.3%
Polystyrene Foam	19	14	33	42.0%	9	25	34	74.3%
Other Plastic	200	0	200	0.0%	203	0	203	0.0%
Subtotal	575	47	622		446	186	632	
Glass								
Refillable glass	44	0	44	0.8%	45	0	45	0.8%
CA redemption value	115	85	200	42.5%	51	152	203	74.8%
Other recyclable	58	42	100	42.0%	26	75	102	74.3%
Other non-recyclable	22	0	22	0.0%	23	0	23	0.0%
Subtotal	239	127	367		145	228	372	
Metals								
Aluminum cans	38	28	67	42.5%	39	29	68	42.5%
Other Aluminum	289	0	289	0.0%	199	95	293	32.3%
Bi-metal Cans	11	0	11	0.0%	11	0	11	0.0%
Steel Food & Bev. Cans	58	42	100	42.0%	26	75	102	74.3%
Other Ferrous	405	295	700	42.1%	182	529	711	74.4%
Other Non-ferrous	6	5	11	43.3%	6	5	11	43.3%
White Goods	209	2	211	0.8%	143	71	214	33.1%
Subtotal	1,017	372	1,389		607	804	1,411	
Leaves and Grass	1,056	765	1,822	42.0%	475	1,375	1,851	74.3%
Subtotal	1,056	765	1,822		475	1,375	1,851	
Organics								
Food waste	633	0	633	0.0%	643	0	643	0.0%
Rubber/Tires	39	28	67	42.0%	17	50	68	74.3%
Wood	889	644	1,533	42.0%	400	1,158	1,557	74.3%
Agri. Crop Residue	78	0	78	0.0%	79	0	79	0.0%
Manure	0	0	0	0.0%	0	0	0	0.0%
Textiles/leather	388	0	389	0.1%	267	128	395	32.4%
Other organics	788	0	789	0.0%	801	0	801	0.0%
Subtotal	2,815	673	3,488		2,208	1,336	3,544	
Other Wastes								
Inert solids	258	187	444	42.0%	116	335	451	74.3%
Hazardous waste	11	0	11	0.2%	11	0	11	0.2%
Subtotal	269	187	455		127	335	463	
Total Other Wastes								
Appliances	11	0	11	0.2%	11	0	11	0.2%
Subtotal	11	0	11		11	0	11	
Total Waste *	8,300	2,800	11,100	25.0%	5,600	5,600	11,300	50.0%

* Rounded to the nearest 100 tons. Projections are based on achieving 25% diversion in 1995, and 50% diversion in 2000, although programs (identified in the SRRE) will likely begin intermittently during the planning periods.

Table 2-4 cont'd

15 Year Waste Generation Projections
Assuming AB 939 Diversion Rates
City of Morgan Hill

WASTE TYPE	2001				2002			
	Disposal	Diversion	Generation	Diversion Percent	Disposal	Diversion	Generation	Diversion Percent
Paper								
OCC/Kraft	230	665	894	74.3%	233	675	909	74.3%
Magazines	93	44	138	32.3%	95	45	140	32.3%
Mixed Paper	466	222	688	32.3%	473	226	699	32.3%
Newsprint	146	428	573	74.6%	148	434	582	74.6%
High Grade	46	22	69	32.4%	47	23	70	32.4%
Other Paper	654	0	654	0.0%	664	0	664	0.0%
Subtotal	1,634	1,381	3,016		1,660	1,404	3,064	
Plastic								
HDPE	15	43	57	74.3%	15	43	58	74.3%
PET	6	17	23	74.4%	6	17	23	74.4%
Film	217	104	321	32.3%	221	105	326	32.3%
Polystyrene Foam	9	26	34	74.3%	9	26	35	74.3%
Other Plastic	206	0	206	0.0%	210	0	210	0.0%
Subtotal	453	189	642		460	192	652	
Glass								
Refillable glass	45	0	46	0.8%	46	0	47	0.8%
CA redemption value	52	154	206	74.8%	53	157	210	74.8%
Other recyclable	27	77	103	74.3%	27	78	105	74.3%
Other non-recyclable	23	0	23	0.0%	23	0	23	0.0%
Subtotal	147	231	378		149	235	384	
Metals								
Aluminum cans	40	29	69	42.5%	40	30	70	42.5%
Other Aluminum	202	96	298	32.3%	205	98	303	32.3%
Bi-metal Cans	11	0	11	0.0%	12	0	12	0.0%
Steel Food & Bev. Cans	27	77	103	74.3%	27	78	105	74.3%
Other Ferrous	185	538	722	74.4%	188	546	734	74.4%
Other Non-ferrous	7	5	11	43.3%	7	5	12	43.3%
White Goods	146	72	218	33.1%	148	73	221	33.1%
Subtotal	616	817	1,433		626	830	1,456	
Leaves and Grass	483	1,397	1,880	74.3%	491	1,420	1,911	74.3%
Subtotal	483	1,397	1,880		491	1,420	1,911	
Organics								
Food waste	654	0	654	0.0%	664	0	664	0.0%
Rubber/Tires	18	51	69	74.3%	18	52	70	74.3%
Wood	406	1,176	1,582	74.3%	413	1,195	1,608	74.3%
Agri. Crop Residue	80	0	80	0.0%	82	0	82	0.0%
Manure	0	0	0	0.0%	0	0	0	0.0%
Textiles/leather	271	130	401	32.4%	276	132	408	32.4%
Other organics	814	0	814	0.0%	827	0	827	0.0%
Subtotal	2,243	1,357	3,600		2,279	1,379	3,658	
Other Wastes								
Inert solids	118	341	459	74.3%	120	346	466	74.3%
Hazardous waste	11	0	11	0.2%	12	0	12	0.2%
Subtotal	129	341	470		131	346	478	
Total Other Wastes								
Appliances	11	0	11	0.2%	12	0	12	0.2%
Subtotal	11	0	11		12	0	12	
Total Waste *	5,700	5,700	11,500	50.0%	5,800	5,800	11,600	50.0%

* Rounded to the nearest 100 tons. Projections are based on achieving 25% diversion in 1995, and 50% diversion in 2000, although programs (identified in the SRRE) will likely begin intermittently during the planning periods.

Table 2-4 cont'd

15 Year Waste Generation Projections
Assuming AB 939 Diversion Rates
City of Morgan Hill

WASTE TYPE	2003				2004			
	Disposal	Diversion	Generation	Diversion Percent	Disposal	Diversion	Generation	Diversion Percent
Paper								
OCC/Kraft	237	686	923	74.3%	241	697	938	74.3%
Magazines	96	46	142	32.3%	98	47	144	32.3%
Mixed Paper	481	229	710	32.3%	488	233	722	32.3%
Newsprint	150	441	592	74.6%	153	448	601	74.6%
High Grade	48	23	71	32.4%	49	23	72	32.4%
Other Paper	675	0	675	0.0%	685	0	685	0.0%
Subtotal	1,687	1,426	3,113		1,714	1,449	3,163	
Plastic								
HDPE	15	44	59	74.3%	15	45	60	74.3%
PET	6	18	24	74.4%	6	18	24	74.4%
Film	224	107	331	32.3%	228	109	337	32.3%
Polystyrene Foam	9	26	36	74.3%	9	27	36	74.3%
Other Plastic	213	0	213	0.0%	216	0	216	0.0%
Subtotal	468	195	663		475	198	673	
Glass								
Refillable glass	47	0	47	0.8%	48	0	48	0.8%
CA redemption value	54	159	213	74.8%	55	162	216	74.8%
Other recyclable	27	79	107	74.3%	28	80	108	74.3%
Other non-recyclable	24	0	24	0.0%	24	0	24	0.0%
Subtotal	152	239	391		154	243	397	
Metals								
Aluminum cans	41	30	71	42.5%	41	31	72	42.5%
Other Aluminum	208	99	308	32.3%	212	101	313	32.3%
Bi-metal Cans	12	0	12	0.0%	12	0	12	0.0%
Steel Food & Bev. Cans	27	79	107	74.3%	28	80	108	74.3%
Other Ferrous	191	555	746	74.4%	194	564	758	74.4%
Other Non-ferrous	7	5	12	43.3%	7	5	12	43.3%
White Goods	150	74	225	33.1%	153	76	228	33.1%
Subtotal	636	843	1,480		646	857	1,503	
Leaves and Grass	499	1,443	1,941	74.3%	507	1,466	1,972	74.3%
Subtotal	499	1,443	1,941		507	1,466	1,972	
Organics								
Food waste	675	0	675	0.0%	685	0	685	0.0%
Rubber/Tires	18	53	71	74.3%	19	54	72	74.3%
Wood	419	1,214	1,633	74.3%	426	1,233	1,660	74.3%
Agri. Crop Residue	83	0	83	0.0%	84	0	84	0.0%
Manure	0	0	0	0.0%	0	0	0	0.0%
Textiles/leather	280	134	414	32.4%	285	136	421	32.4%
Other organics	840	0	840	0.0%	854	0	854	0.0%
Subtotal	2,316	1,401	3,717		2,353	1,423	3,776	
Other Wastes								
Inert solids	122	352	473	74.3%	124	357	481	74.3%
Hazardous waste	12	0	12	0.2%	12	0	12	0.2%
Subtotal	133	352	485		136	357	493	
Total Other Wastes								
Appliances	12	0	12	0.2%	12	0	12	0.2%
Subtotal	12	0	12		12	0	12	
Total Waste *	5,900	5,900	11,800	50.0%	6,000	6,000	12,000	50.0%

* Rounded to the nearest 100 tons. Projections are based on achieving 25% diversion in 1995, and 50% diversion in 2000, although programs (identified in the SRRE) will likely begin intermittently during the planning periods.

Table 2-4 cont'd

15 Year Waste Generation Projections
Assuming AB 939 Diversion Rates
City of Morgan Hill

WASTE TYPE	2005			
	Disposal	Diversion	Generation	Diversion Percent
Paper				
OCC/Kraft	245	708	953	74.3%
Magazines	99	47	147	32.3%
Mixed Paper	496	237	733	32.3%
Newsprint	155	456	611	74.6%
High Grade	50	24	73	32.4%
Other Paper	696	0	696	0.0%
Subtotal	1,741	1,472	3,213	
Plastic				
HDPE	16	45	61	74.3%
PET	6	18	24	74.4%
Film	232	110	342	32.3%
Polystyrene Foam	9	27	37	74.3%
Other Plastic	220	0	220	0.0%
Subtotal	483	201	684	
Glass				
Refillable glass	48	0	49	0.8%
CA redemption value	55	164	220	74.8%
Other recyclable	28	82	110	74.3%
Other non-recyclable	24	0	24	0.0%
Subtotal	157	247	403	
Metals				
Aluminum cans	42	31	73	42.5%
Other Aluminum	215	103	318	32.3%
Bi-metal Cans	12	0	12	0.0%
Steel Food & Bev. Cans	28	82	110	74.3%
Other Ferrous	197	573	770	74.4%
Other Non-ferrous	7	5	12	43.3%
White Goods	155	77	232	33.1%
Subtotal	657	871	1,527	
Leaves and Grass	515	1,489	2,004	74.3%
Subtotal	515	1,489	2,004	
Organics				
Food waste	696	0	696	0.0%
Rubber/Tires	19	54	73	74.3%
Wood	433	1,253	1,686	74.3%
Agri. Crop Residue	86	0	86	0.0%
Manure	0	0	0	0.0%
Textiles/leather	289	138	428	32.4%
Other organics	867	0	867	0.0%
Subtotal	2,390	1,446	3,836	
Other Wastes				
Inert solids	126	363	489	74.3%
Hazardous waste	12	0	12	0.2%
Subtotal	138	363	501	
Total Other Wastes				
Appliances	12	0	12	0.2%
Subtotal	12	0	12	
Total Waste *	6,100	6,100	12,200	50.0%

* Rounded to the nearest 1,000 tons. Based on achieving 50% diversion in 2000.
See Section 10 for an estimate of diversion amounts by year based on the SRRE.

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 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. 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 encompasses several broad categories, including:

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

Table 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.

This component (1) describes existing conditions and presents source reduction objectives for the City of Morgan Hill, (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.

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 of Morgan Hill. 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 of Morgan Hill can expect to divert a portion of the total waste stream by implementing the following objectives:

- reduce the use of non-recyclable materials

- replace disposable materials and products with reusable materials and products
- purchase products with a reduced packaging content
- 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

3.2.1 Targeted Materials

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 in Section 3.4 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 Morgan Hill. The jurisdiction has attempted to identify all potential and ongoing source reduction efforts, including all programs sponsored by the City of Morgan Hill. The City of Morgan Hill has also used a survey to identify efforts sponsored by major waste generators in the jurisdiction.

3.3.1 Local Government Activities

The City of Morgan Hill currently engages in the following source reduction activities:

- purchasing program for paper and paper products which gives a 5 percent price preference, whenever feasible, to the purchase of recycled paper.
- use of double-sided copiers in offices

3.3.2 Residential Activities

Residential source reduction activities in the City of Morgan Hill 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
- use of cloth diapers instead of disposables

3.3.3 Commercial and Industrial Activities

Commercial and industrial activities in the City of Morgan Hill 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
- use of scratch pads from blank sides of paper
- cloth towels and sponges in cafeterias
- routing memos
- reuse of file folders
- posting of source reduction and recycling reminders on bulletin boards and memos
- use of scrap paper or voice mail for interoffice communications
- renting 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 in 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
- use of electronic mail

All of the source reduction activities and programs identified above are expected to be continued in the future. However, the quantitative effectiveness of most current source reduction activities is difficult to assess, and the description of existing conditions for these source reduction activities is therefore qualitative. Although the City of Morgan Hill has established an inventory of source reduction activities for which the City will develop diversion estimates in the future, the City has opted not to include existing source reduction diversion in its current diversion figures for the

SRRE, with the exception of 79.6 tons of waste material diverted through reusable diaper services.

Additionally, many of the source reduction activities affecting the waste generated by the City of Morgan Hill 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.

3.3.4 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., frozen juices, concentrated pesticides, and concentrated soaps).
- One manufacturer is using reusable, collapsible or stackable boxes to replace expendable corrugated boxes for parts delivery from its suppliers.
- Over the past ten years aluminum beverage containers have been reduced in thickness and hence weight.
- Packaging changes initiated by one manufacturer include:
  - Disposable diapers and diaper packages changed so that net total amount of materials in product and package was 50 percent less then preceding design.
  - Detergent with bleach eliminates need for separate 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

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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-0-424, Washington, D.C.: U.S. Government Printing Office, October 1989.

warranty on the dishwasher to be increased because the tub is more durable.

- A new blow-molding tool for plastic (HDPE) milk bottles reduces their weight 10 percent while increasing strength.
- A heat-set technology makes it possible to use PET containers for liquids that must be hot-filled. The new technology allowed a juice company to switch from glass to plastic bottles, resulting in a 25 percent reduction in weight and long-term cost savings in bottling and shipping.
- One soap manufacturer has made a single-bar 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 previously outlined. 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 issued by the California Integrated Waste Management Board (CIWMB) pursuant to AB 939. However, the impact of these alternatives is, for the most part, difficult to quantify due to a lack of data on the impact of source reduction on specific elements of the waste stream.

For each evaluation criterion, a rating of high, medium, or low is assigned, and the potential issues are discussed. As structured by the regulations governing AB 939, some of the criteria by which the alternatives are

required to be evaluated are positive in tone (e.g., effectiveness), while others are inherently negative (e.g., hazard). A high rating for a positive criterion implies a positive rating; however, a high rating for a negative criterion corresponds to few or no impacts associated with this potential problem. The results for the evaluation are summarized in Section 3.5, Table 3-2. Source reduction alternatives evaluated are described below.

Many of these alternatives are complementary to each other and depend significantly on the implementation of other alternatives and programs presented in the recycling, composting, and special wastes components of this Source Reduction and Recycling Element (SRRE). 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, rather than 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 modifications 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 non-procurement 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.

3.4.1 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 Section 3.2 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 and recycling 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 garbage 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. Quantity-based user fees are directly proportional to actual disposal costs; consequently, residents have the opportunity to reduce costs by generating less 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 quantity-based user fee 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.

Rate structure modifications, (e.g. quantity-based user fees and disposal fee modifications) are evaluated below to determine whether this alternative is appropriate for the City of Morgan Hill as well as to compare it to other alternatives.

Effectiveness. High.[1] 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, rate structure modifications provide an incentive for increased participation in recycling and community composting programs.

Rate structure modifications 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. Medium.[2] 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. Rate structure modifications 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. Medium. Modifications to rate structures, in general, are moderately adapted to existing programs. Rate structure modifications are sensitive to the types of refuse billing systems used to determine fees for refuse collection service.

Consequences on the Waste Stream. High.[3] Some shifting of wastes will occur in conversion to a quantity-based system as more waste is compacted into each can, increasing the density of the waste stream. Rate

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1 Refers to relative rating of the alternative with respect to this criterion.

2 Note that several of the criteria—hazard, consequences on the waste stream, facility requirements, institutional barriers, and estimated cost—on the waste stream—are inherently negative. A rating of high for these criteria corresponds to few or no impacts associated with these potential problems.

3 See Footnote 2.

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. Medium. Due to the existing contract with South Valley Refuse Disposal and the refuse billing system established, rate structure modifications would likely be implemented in the medium-term planning period.

Facility Requirements. High.[4] No additional facilities are needed to implement rate structure modifications.

Consistency with Local Plans and Policies. Medium. This alternative is generally consistent with the plans, policies, and ordinances of the City of Morgan Hill.

Institutional Barriers. Low.[5] The rate setting and approval process may require a high degree of coordination 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 private haulers and/or disposal facilities are included in the implementation and rate-setting process. Additionally, potential opposition from the community could preclude implementation in the short-term planning period.

Estimated Cost. High.[6] The costs associated with implementing rate structure modifications are a function of the City staff time required to pursue negotiations with the waste haulers, develop the rate structure and program, seek approval for the program from the City Council, conduct public hearings, and develop a public information campaign to introduce the program to the rate payers. In addition, the City would incur costs for either containers or approved stickers for collection bags and for modifications to existing billing operations. Total costs for the City of Morgan Hill are not expected to be high.

End Uses. Not applicable.

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4 See Footnote 2.
5 See Footnote 2.
6 See Footnote 2.

3.4.2 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 Section 3.2.

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 economic 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 programs. Such economic assistance includes funds to purchase copy machines that produce double-sided copies and education materials for staff of these businesses. Reduced business license fees can also be granted to businesses that implement source reduction activities.

Economic Assistance. Economic assistance 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 of Morgan Hill 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 awareness of the overall waste reduction effort.

Economic Disincentives. Penalties and/or fines could be imposed by the City of Morgan Hill on businesses that do not develop and implement source reduction programs and 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). 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 also provide a source of funding for other selected source reduction programs.

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.

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 of Morgan Hill, as well as to compare it to other alternatives.

Effectiveness. Medium. The potential benefits of economic incentives are difficult to quantify. Advanced disposal fees, however, 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.

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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.

Hazard. High. There are no major hazards created by the economic incentives and disincentives presented in this alternative.

Ability to Accommodate Change. High. Economic incentives can be modified to accommodate to changes in consumption patterns, availability of materials, and the economy. 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. Medium. Economic incentives are not expected to result in shifts in waste-type generation.

Implementation Period. High. Economic incentives and disincentives must be approved by the City Council. The amount of time required for the approval process and implementation of the program can be accomplished in the short-term planning period (1995).

Facility Requirements. High. No facilities are needed to implement this alternative.

Consistency with Local Plans and Policies. Low. Providing economic assistance to businesses within the City of Morgan Hill, 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. Low. The incentives proposed under this alternative would in many cases have to be funded 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 process of establishing economic incentives and disincentives may require a high degree of coordination between City agencies responsible for administering the waste management program and those responsible for setting and approving local budgets and programs.

Estimated Cost. Medium. The costs of this alternative would include the use of the City of Morgan Hill staff resources to develop and administer the incentive and disincentive programs. Additional costs include the direct dollar amounts of any grants or funding provided under the incentive programs.

End Uses. Not applicable.

3.4.3 Alternative 3 - Technical Assistance, Education, and Promotion

The programs presented in this alternative address all source reduction objectives identified above in Section 3.2. These activities include waste evaluations, technical assistance, educational efforts, promotional programs (i.e., public recognition and awards), and commercial procurement 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 of Morgan Hill. For example, the City of Morgan Hill could assist large-quantity commercial businesses in the community 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 SIC codes, number of employees, 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.

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; and (5) increased manufacturing efficiency.

On-Site Composting. Because yard waste is one of the largest component of the waste stream, backyard composting, xeriscaping, and mulching assistance 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 of Morgan Hill can be a valuable 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. Public education programs are vital to the success of other programs (such as backyard composting and grant funding) for community groups seeking to participate in source reduction efforts.

Public Recognition and Awards. Public recognition can be used by the City of Morgan Hill 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 of Morgan Hill 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.

Non-procurement Programs. These programs involve all methods to implement source reduction at City offices that are not associated with purchasing decisions. 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, and using electronic mail. This alternative provides an opportunity for the City of Morgan Hill 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.

In summary, this alternative consists of the following source reduction activities: waste evaluations, technical assistance, backyard composting programs, educational efforts, public recognition and awards, and non-procurement programs. This alternative is evaluated below to determine

whether it is appropriate for the City of Morgan Hill , as well as to compare it to other alternatives.

Effectiveness. High. 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 outlined under this alternative support, enhance, and increase the effectiveness of other source reduction programs and alternatives.

Hazard. High. There are no major hazards associated with the programs presented by this alternative.

Ability to Accommodate Change. High. This alternative readily accommodates to change in the waste stream, as well as to changes in consumer purchasing behavior and available products and alternatives. 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. High. This alternative is not expected to result in shifts in waste-type generation.

Implementation Period. High. Initial efforts in technical assistance, public education, and promotional activities can be implemented in the short-term planning period (1995). The need for additional staffing and the more involved aspects of the alternative, such as developing school curricula, could be delayed to the medium-term planning period (2000).

Facility Requirements. High. No additional municipal facilities in the City of Morgan Hill would be required. Existing educational facilities could serve as locations for seminars and educational workshops.

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

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

Estimated Cost. Medium. The costs for technical assistance, education, and promotion will vary depending on a jurisdiction's commitment to funding a broad spectrum of programs. 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 consultants. Additional costs include those for publicity and public relations associated with awarding recognition and highlighting of specific activities within the community.

End Uses. Not applicable.

3.4.4 Alternative 4 - Regulatory Programs

Several regulatory alternatives are available to the City of Morgan Hill that address the source reduction objectives outlined above in Section 3.2. These programs include:

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

Each of these regulatory programs would require continuous enforcement efforts.

Local Procurement Programs. The City has established a procurement policy that gives a 5 percent price preference for recycled paper and paper products. Additionally, the City of Morgan Hill could expand the procurement program to 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.

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 source reduction activities to be implemented. Businesses would also be required to report quantities of waste source reduced. 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). 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 of Morgan Hill 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 plan would consist of describing (1) how much and what type of waste would be added to the waste stream, and (2) what programs would be implemented to encourage source reduction in the developed area.

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

Effectiveness. Medium. The effectiveness of regulatory programs would depend on (1) the level of regulation imposed by the City of Morgan Hill, (2) the materials targeted, (3) adherence to the regulations by the community, and (4) the level of enforcement.

Hazard. High. There are no major hazards associated with the regulatory programs described above.

Ability to Accommodate Change. Low. Procurement policies, waste reduction plans, and land development requirements are all fairly flexible and 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 of Morgan Hill.

Consequences to the Waste Stream. Medium. Changes in the waste stream composition will depend on the effectiveness of each program. A product ban will reduce the quantities of the banned product present in the waste stream. However, the ban will also 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. Medium. Procurement programs, waste reduction plans, and land-development plans can all be implemented in the short-term planning period (1995). 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. The complexity of, and opposition to, these programs may preclude their implementation in the short-, and perhaps medium-term, time frame.

Facility Needs. High. There are no facility requirements for this alternative.

Consistency with Local Plans and Policies. Medium. Regulatory programs might be viewed as inconsistent with current City policies that encourage voluntary participation in City-sponsored environmental conservation programs.

Institutional Barriers. Low. 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 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. Medium. Each of the programs outlined in this alternative would require resources from the City of Morgan Hill 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. The costs to merchants associated with a product ban are unknown. 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 Program

In this section, the City of Morgan Hill presents the results of the qualitative evaluation of the alternatives and programs presented in the previous section. To accomplish this, the City of Morgan Hill 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 of Morgan Hill 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 and programs were assigned ratings of high, medium, and low according to the assessment of their evaluation criteria. The results of these ratings are presented in Table 3-2.

3.5.1 Short-Term Planning Period

In order to meet the goals and objectives outlined in this component, the City of Morgan Hill has selected the following public education and technical assistance programs to be implemented in the short-term planning period (1995).

Alternative 3 - Technical Assistance, Education, and Promotion. The City of Morgan Hill will implement public education and technical assistance programs in an effort to foster source reduction in the City. In addition to its ranking according to the evaluation criteria, this alternative was selected because it will be uniquely effective in achieving results for a program element whose fundamental emphasis is on changing the behavior of producers and consumers.

Another factor in the selection of the public education and technical assistance alternative is the City's ability to implement this alternative in conjunction with the efforts of other jurisdictions, including the State Department of Conservation, and the CIWMB. The development of promotional and public education materials can be coordinated with neighboring jurisdictions in Santa Clara County. Joint funding for any materials to be disseminated by means of broadcast or print media covering more than one jurisdiction can be explored.

Programs to be implemented under this alternative include:

- A program to provide technical assistance to businesses and consumers/homeowners through workshops and seminars on source reduction techniques and activities.
- A program to provide public education efforts through the media, the school system, and City offices programs to increase awareness of source reduction and waste management issues.
- A program to provide public recognition and awards to individuals and businesses that implement source reduction activities.
- Workshops to promote backyard composting and xeriscaping.

3.5.2 Medium-Term Planning Period

Alternative 4 - Regulatory Programs. The City will establish land-use requirements that promote waste management planning.

Alternative 1 - Rate Structure Modifications. The City of Morgan Hill will implement modifications to the current residential rate structure for collection and disposal. These modifications will take the form of a quantity-based user fee designed to encourage source reduction of materials that are not reusable, recyclable, or compostable.

In addition to its ranking according to the evaluation criteria, this alternative was selected because it will support alternatives and programs selected under the recycling and composting components of this SRRE.

3.5.3 Quantity and Types of Waste Anticipated to be Diverted

Current diversion quantities for source reduction by waste type are not known for the City of Morgan Hill. Therefore, it is not currently possible to quantify the estimated contribution of the alternatives selected above towards the mandated waste diversion goals specified in AB 939, and the City is not taking credit for diversion through source reduction at this time (with the exception of 79.6 tons of material diverted through the use of cloth diaper services). The City will pursue methods of evaluating, monitoring, and reporting on source reduction diversion as programs are implemented.

The types of materials that are anticipated to be source reduced through the selected alternatives include:

- Packaging materials, including plastics and paper products
- Construction materials
- Single use products
- Repairable products, including appliances and electronics
- Paper, including corrugated, high grade, and mixed waste paper
- Yard waste

- Household hazardous waste

3.6 Program Implementation

3.6.1 Responsibility for Implementation

The City of Morgan Hill's Community Development Department will be responsible for implementing all of the source reduction programs and activities selected in this component.

3.6.2 Required Implementation Tasks

See Table 3-3 for implementation tasks for selected programs.

3.6.3 Implementation Schedules

See Table 3-3 for the implementation schedule for selected programs.

3.6.4 Implementation Funding Requirements

The implementation costs for the alternatives and programs selected in this component have been combined with those for the Education and Public Information Component and can be found in Chapter 7, Section 7.6.4. These costs are estimated to be $34,000 per year for program planning, development, implementation, and monitoring.

3.7 Monitoring and Evaluation

3.7.1 Methods to Measure Achievement

The objectives of the City of Morgan Hill source reduction program are to increase the public's participation in source reduction programs and to heighten awareness of the need to reduce, reuse, recycle, and compost. The following methods will be implemented in order to monitor the achievement of these objectives:

- A waste generation study 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.

- A 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.
- Annual reports to monitor progress and compliance with the requirements of AB 939 will be used to monitor and measure the achievements of the City programs.

Additional monitoring activities to be implemented are described in Section 7.7 of the Education and Public Information Component.

3.7.2 Evaluation 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.

3.7.3 Responsibility for Monitoring and Evaluation

The City of Morgan Hill's Community Development Department will be responsible for monitoring and evaluating all of the program activities selected in this component.

3.7.4 Monitoring and Evaluation Funding Requirements

Funding requirements for the monitoring and evaluation of the source reduction programs selected in this component include funds for record-keeping and surveying participation rates. These funds are included in funding estimates presented in Section 7.7.4 of the Education and Public Information Component and are estimated to be $4,000 per year.

3.7.5 Contingency Measures

The following measures will be implemented if the source reduction objectives identified in Section 3.2 are not achieved.

- Evaluate the need for increased funding for source reduction programs such as waste audits, specialized technical assistance, and more aggressive source reduction awareness campaigns.
- Modify any source reduction programs that are determined to be inadequate.
- Identify additional source reduction programs for consideration including modified disposal fees and economic incentive/disincentive programs.

EMCON ASSOCIATES

WHAT IS SOURCE REDUCTION ?

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

Printed on Recycled Paper

Table 3-2
Alternatives Evaluation
for Source Reduction Programs

Program Categories	Evaluation Criteria					
	Effectiveness	Hazard Rating	Ability to Accommodate Change	Consequences on the Waste Stream	Implementation Period	Facility Requirements
Category 1 Rate Structure Modifications	high	medium	medium	high	medium	high
Category 2 Economic Incentives	medium	high	high	medium	high	high
Category 3 Technical Assist. & Education	high	high	high	high	high	high
Category 4 Regulatory Programs	medium	high	low	medium	medium	high

Program Categories	Additional Considerations			
	Consistency With Local Plans	Institutional Barriers	Cost Rating	End Uses
Category 1 Rate Structure Modifications	medium	low	high	N/A
Category 2 Economic Incentives	low	low	medium-low	N/A
Category 3 Technical Assist. & Education	high	high	medium	N/A
Category 4 Regulatory Programs	medium	low	medium	N/A

Table 3-3
Calendar of Source Reduction Tasks

Targeted Generator	Type of Program	Implementation Tasks	Date
Government/Business and Residential	Public Education	Prepare pamphlet encouraging the re-use of items, purchase of durable products and recyclable products; develop home composting brochure; and encourage the use of source reduction practices; distribute a "junk mail" reduction pamphlet	Mid-1992
Residential	On-site Composting and Xeriscaping	Encourage use of on-site mulching of grass clippings on all residential lawns; conduct workshops	Late-1993
Business	Public Recognition and Awards	Establish criteria and publicity mechanism	Early-1994
Residential	Technical Assistance	Develop source reduction checklists to be posted at local supermarkets	Early-1994
Residential	Quantity-Based User Fee	With SVRD, conduct a rate study; determine fee	1996
Business	Land-Use Requirements	Establish requirements that promote waste reduction planning	1997

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.

Markets for recovered materials are critical for the recycling process to be complete. Accordingly, recycling plans must consider market development as well as material separation and collection program development.

The City of Morgan Hill 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, industrial, and self-haul 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 in the most cost-effective manner. The objectives for the City of Morgan Hill have been developed in conjunction with the City's franchise waste hauler, South Valley Refuse Disposal, Inc. (SVRD), and neighboring jurisdictions in southern Santa Clara County to complement, support, and take advantage of the objectives and programs of communities using the same regional solid waste facilities. These objectives are to be implemented in the short-term planning period (1991-1995) and continued during the medium-term planning period (1996-2000).

4.2.1 Short-Term Objectives

The City can expect to divert 9.1 percent of the total waste stream in the short term by achieving the following objectives:

- Develop residential recycling programs
- Develop multi-family dwelling recycling programs
- Develop commercial/industrial recycling programs
- Increase the number of material types collected from the residential and commercial sectors
- Establish a diversion program for materials currently collected via industrial debris boxes and self haul loads
- Increase local markets for materials made from post-consumer waste

4.2.2 Medium-Term Objectives

The City can expect to divert additional 18.3 percent of the waste stream in the medium term by achieving the following objectives:

- Divert additional waste types from the residential and commercial waste streams
- Continue programs implemented in the short-term planning period

- Increase local markets for materials made from post-consumer waste

4.3 Waste Types Targeted for Diversion

Target waste types for recycling have been identified from the results of the solid waste generation study 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, computer paper and colored ledger
- mixed paper
- PET, HDPE, expanded polystyrene
- glass
- aluminum cans
- tin cans
- scrap metal
- wood
- inert solids (asphalt, concrete, construction and demolition debris)

Recycling alternatives targeting the above waste types are evaluated below in the Section 4.5 entitled *Evaluation of Program Alternatives* according to their effectiveness in meeting the recycling objectives outlined above.

4.4 Existing Conditions Description

This section describes existing recycling activities and programs in the City of Morgan Hill. Potential and ongoing recycling efforts have been reviewed and documented, including all of the City programs. A limited

telephone survey was also used in order to identify additional recycling efforts.

The quantities of wastes diverted from the City's waste stream via recycling activities, by waste category and waste type, are presented in Appendix C, Tables 1 and 2. The existing recycling diversion rate is estimated to be 6.5 percent of the current total waste stream.

The City of Morgan Hill has one franchise waste hauler, SVRD. SVRD operates a transfer station at San Martin and a landfill at Pacheco Pass, both of which are used for wastes generated from the City of Morgan Hill. SVRD has a number of salvage and recycling programs in place at these facilities. In addition, the City of Morgan Hill and SVRD have discussed the feasibility of developing and implementing a number of recycling and other diversion programs in the City. All of the existing and potential programs will be evaluated as alternatives in Section 4.5 of this component. The selection of alternatives in Section 4.6 will reflect that evaluation of the alternatives in Section 4.5, including the ability of SVRD to implement them and the City's interest in developing a solid waste program that is (1) appropriate to the conditions of the jurisdiction, and (2) that is a complementary, coherent, comprehensive, and cost-effective package.

4.4.1 Recycling Activities

The following recycling activities were found to be diverting waste from the landfill:

Drop-off and Buy-back Recycling Centers. The Lucky Food Store, Western Recycling, and the ENVIPCO Machines at the two Nob Hill Foods stores are the only state-certified recycling centers currently operating in the City of Morgan Hill. They are certified under AB 2020, which means the general public is paid California Redemption Value, as opposed to scrap value, for aluminum cans, glass, and PET containers that are marked "California Redemption Value." The State Department of Conservation (DOC) will certify a recycling center if it is open a minimum of 30 hours a week, of which five hours must be other than 9 a.m. to 5 p.m., Monday through Friday. Other recycling centers in and around Morgan Hill include: A-1 Recycling Circus; Linda's Place Day Care Preschool; Little Sonshine School House; the Morgan Hill Times; St. Catherine's School; San Martin Transfer Systems; South Bay Metal and Salvage; and Trinie Martin Recyclers.

City Programs. There is currently an informal program at City Hall and at the Public Works Department facility to collect office paper, newspaper, aluminum cans, and some plastic and glass. Approximately 1,172 pounds of paper are collected each month. The recyclable materials are taken to the following places: office paper to the San Martin Transfer Station, newspaper to the San Martin Transfer Station or St. Catherine's School drop-off box, plastic and glass to Western Recycling, and aluminum cans to the Morgan Hill Fire Department who donates the revenue (cans are sold to Western Recycling) to the California Burn Foundation. The City's Environmental Programs Division plans to expand this program within the next year to include all City facilities.

Curbside Residential and Commercial Recycling Programs. There are currently no curbside residential or commercial recycling programs in Morgan Hill. The City is currently considering a SVRD proposal to implement a residential curbside recycling program similar to the program operating in Gilroy. It is anticipated that the City Council will take action on this proposal in late 1991 or early 1992. If the proposal is approved, SVRD has indicated that the program could be operational within three months from the date of approval.

Salvage and Material Recovery. SVRD has established salvage and material recovery programs at both the San Martin Transfer Station and the Pacheco Pass Landfill. Materials such as inert solids, concrete, asphalt, construction and demolition wastes, white goods, and scrap metals are salvaged for reuse and recycling. Wood wastes are also salvaged and chipped for hog fuel, although this is not an acceptable diversion program under AB 939.

Of the recycling activities and programs identified above, the City of Morgan Hill does not anticipate that any will be phased out or discontinued in the future as a result of establishing new recycling programs.

4.5 Evaluation of Program Alternatives

The City of Morgan Hill 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.

The following recycling alternatives are evaluated within their respective category based on the evaluation approach presented in Appendix A. For each evaluation criterion, a rating of high, medium, or low is assigned, and the potential issues are discussed. As structured by the regulations governing AB 939, some of the criteria by which the alternatives are required to be evaluated are positive in tone (e.g., effectiveness), while others are inherently negative (e.g., hazard). A high rating for a positive criterion implies a positive rating; however, a high rating for a negative criterion corresponds to few or no impacts associated with this potential problem. The results of the evaluation are summarized in Table 4-1.

Residential Alternatives

Alternative 1 - Curbside Collection

Alternative 2 - Mobile Collection System

Alternative 3 - Buy-Back Center

Alternative 4 - Source-Separated Recycling Program: Multi-Family Dwellings

Non-Residential Alternatives

Alternative 1 - Commercial/Industrial Recycling Program

Alternative 2 - Manual Material Recovery Operation/Mechanized Material Recovery Facility

Alternative 3 - Salvage at Solid Waste Facility

Residential *and* Non-Residential Alternatives

Alternative 1 - Drop-Off Recycling Center

4.5.1 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. Additional materials, such as corrugated cardboard, magazines, and mixed paper, can be added to the program in the future in order to increase recovery via curbside.

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.

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

Effectiveness. High.[1] This alternative would be effective in enhancing the participation and capture rates for residential generators and in reduc-

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[1] Refers to relative rating of the alternative with respect to this criterion.

ing the amount of targeted recyclable material(s) disposed of in landfills. A curbside collection program could reduce the total waste generated between 3 and 7 percent.

Hazard. High.[2] This alternative presents no major hazards.

Ability to Accommodate Change. Medium to High. The ability to accommodate change is dependent on the system chosen. A commingled system is more flexible since it is simply a matter of allowing residents to place additional commodities in the container. A source separated system offers less flexibility to accommodate additional commodities as markets become available since additional containers would be needed for collection.

Consequences to the Waste Stream. High.[3] This alternative has no known impact on shifts in waste-type generation.

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

Facility Requirements. Low.[4] Depending upon the collection technique implemented, a facility may be required for processing the collected recyclables and preparing them for shipment to markets.

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

Institutional Barriers. High.[5] There are no known institutional barriers to implementing this alternative.

Estimated Cost. Medium to Low.[6] 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. Costs for the City of Morgan Hill are estimated to range from $99,000 to $297,000 per year based on assumed collection costs of $100 to $300 per ton.

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2 Note that several of the criteria—hazard, consequences on the waste stream, facility requirements, institutional barriers, and estimated cost—are inherently negative. A rating of high for these criteria corresponds to few or no impacts associated with these potential problems.

3 See Footnote 2.

4 See Footnote 2.

5 See Footnote 2.

6 See Footnote 2.

End Uses. See Section 4.6.6, "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. Mobile systems are most useful for rural areas with low-density populations and can be effective in urban areas that do not currently have a curbside program. Generally, the operator establishes a schedule to be at a certain location during specified hours. It is an inexpensive way to serve a number of communities with the same equipment.

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

Effectiveness. Medium. Because the City does not currently have a residential recycling system in place, this alternative could have a significant impact on diversion rates for recyclables.

Hazard. High. This alternative presents no major hazards.

Ability to Accommodate Change. Medium. 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. High. This alternative has no impact on shifts in waste-type generation.

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

Facility Requirements. Medium. 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. Low. This alternative is consistent with City plans and policies.

Institutional Barriers. Medium. Some institutional barriers exist for this alternative. A location would have to be selected and any necessary permits filed.

Estimated Cost. Medium. Capital costs to establish a mobile collection system are estimated to range from $50,000 to $100,000.

End Uses. See Section 4.6.6, "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

A buy-back center is essentially a drop-off center at which participants are paid for the materials they bring in. Buy-back centers focus on the more valuable commodities in the waste stream, commodities for which there are ready, reliable markets. 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 of Morgan Hill, as well as to compare it to other alternatives.

Effectiveness. Low. More buy-back centers in the City would likely be ineffective and may even cause a shift of waste from one recycling program to another (e.g., less waste collected at other existing drop-off centers or future curbside programs).

Hazard. High. This alternative presents no major hazards. Physical hazards associated with dumping glass and handling other recyclables could potentially be a problem.

Ability to Accommodate Change. High. 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. High. This alternative has no known impact on shifts in waste-type generation.

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

Facility Requirements. Low. 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. Medium. This alternative is consistent with local plans and policies.

Institutional Barriers. Medium. 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.

Estimated Cost. Medium to Low. 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 4.6.6, "Market Conditions."

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

Alternative 4 - Source-separated recycling program: multi-family dwellings

This alternative addresses the objective of establishing recycling programs for multi-family dwellings. The program could consist of setting up debris boxes, garbage cans, or dumpsters for collection of recyclables located on-site. For some multi-family dwellings a door-to-door recycling program could be established. Multi-family dwellings typically consist of apartment renters, condominium and townhome owners or renters, residents of senior citizen homes, and mobile home park residents. Collection at these types of dwellings is attractive because of the large amount of materials concentrated in a small area. There are some inherent problems, however, in multi-family recycling programs: (1) frequent turnover rates of tenants, on-site managers, and property management; (2) limited storage space in rental property; (3) approval of the program from the owner of the

building. All of these combine to make coordinating a successful multi-family recycling program difficult.

Currently in the City of Morgan Hill there are no recycling programs on-site at multi-family dwellings. There are approximately 1,707 multi-family dwelling units in the City (1991 figure), or approximately 20 percent of the housing stock. 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. High. 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. Medium. 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. Medium. 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. High. Multi-unit dwelling recycling programs would have no impact on shifts in waste-type generation.

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

Facility Requirements. Medium. 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 con-

tainers. 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. Medium. Minor changes to existing plans and policies would be required. 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. Medium. 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. Medium to Low. Estimated costs for a multi-family dwelling recycling program in the City of Morgan Hill are estimated to range from $24,700 to $74,100 per year based on assumed collection costs ranging from $100 to $300 per ton. 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 4.6.6, "Market Conditions."

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

4.5.2 Non-Residential Alternatives

Alternative 1 - Commercial 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. Because the commercial waste stream accounts for 25 percent of the City's landfilled waste stream, the City can expect to divert a significant portion of the waste stream

through a commercial recycling program. Before instituting a City-wide commercial 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. High. This alternative would be effective in reducing the amount of targeted recyclable materials in the commercial 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, ferrous metals, and wood.

Hazard. High. This alternative presents no major hazards.

Ability to Accommodate Change. Medium. The flexibility of a commercial recycling program is dependent upon whether or not a central processing facility is available. A source separated commercial program will likely be more appropriate during the short-term planning period while a MRF is being developed which will provide more flexibility in recycling options.

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

Implementation Period. High. 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 initiated for at least some materials (e.g. corrugated cardboard) in the short-term planning period (1995).

Facility Requirements. Low. Facility needs for this alternative include additional trucks 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. High. This alternative is consistent with local plans and policies.

Institutional Barriers. Low. Some businesses are unwilling to participate in recycling programs, as these programs are generally not revenue-producing, and can even cost the business. Also, space constraints for waste collection at commercial/industrial facilities are often a barrier.

Estimated Cost. Medium to Low. The cost of a commercial recycling program is dependent on the number of recyclable materials collected and the service area. Additional collection vehicles and bins would be required for this option in servicing participating businesses if a commercial collection program is developed. However, the incremental costs of adding additional collection to the existing refuse collection system and/or rerouting the existing collection system are less than the costs of considering each of these separately. While the additional collection would increase the collection services required, it would decrease the quantity of refuse to be collected for participating businesses. For example, this could perhaps result in a decreased refuse collection frequency from three times per week to only two. Depending on exact quantities and collection methods, additional collection effort could increase commercial collection costs by 5 to 50 percent. Based on an assumed collection cost of $100 per ton and the collection of an estimated 641 tons of recyclable material, this would amount to a collection cost of $64,100 per year.

End Uses. See Section 4.6.6, "Market Conditions."

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

Alternative 2 - 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 facilities involve sorting loads of waste in order to recover recyclable materials. Many facilities involve a combination of manual and mechanical sorting processes. 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 loads of mixed waste or from commingled recyclables, as long as the materials received are not contaminated, as defined by the materials markets. A waste collection system that combines commingled collection of designated recyclables with a material recovery operation has the potential for recovering a wide variety of materials at less cost than if the material types were collected separately.

Manual material recovery facilities are designed for the receiving, 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.

The majority of material recovery operations are designed to receive recyclable materials from commingled collection programs or specially selected loads of commercial or industrial wastes. Very few material recovery operations have been built to recover materials from the existing residential and commercial waste stream.

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

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

Hazard. Medium. 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. 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. Medium. Both manual and mechanized facilities are moderately adaptable to changing conditions.

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

Implementation Period. Medium. A MRF capable of segregating commingled recyclables from the City and possibly from other jurisdictions would require several years to design, permit, and construct. South Valley Refuse and Disposal, the City of Morgan Hill's franchise hauler, has obtained local planning permits for material recovery at the San Martin

transfer station. As a result, it is possible that a MRF operation could be implemented before 1995.

Facility Requirements. Low. 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. The size and design of the facility would depend upon the flowrate of materials to the facility and the degree of source separation involved.

Consistency with Local Plans and Policies. High. The facilities in this alternative are consistent with local plans and policies. The City's franchise hauler has obtained local permits for a material recovery operation at the San Martin transfer station.

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

Estimated Cost. Low. 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. Expressed on a unit cost basis costs could range from $10 to $40 per ton of input material. Assuming a MRF input of 1,878 tons per year this would amount to an annual cost of $18,780 to $75,120.

End Uses. See Section 4.6.6, "Market Conditions."

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

Alternative 3 - Salvage at solid waste facility

Salvaging at solid waste facilities can take several forms. In the form considered here, uncontaminated loads of wood, metals, yard waste, and inert solids (soil, concrete, and asphalt) arriving at the San Martin transfer station and landfill would be diverted to separate tipping areas for stockpiling and recovery. This form of salvaging would be similar to a drop-off facility and would be coupled with a tipping fee rate structure that provides waste generators and/or haulers with incentives to deliver wastes to the salvaging facility in a segregated form. For additional information regarding rate structure modifications, see Section 3.4.1. Loads subject to salvage at solid waste facilities include industrial/roll-off and self-haul loads. This

program would be operated by South Valley Refuse and Disposal, the operator of the San Martin transfer station and the Pacheco Pass landfill.

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

Effectiveness. High. This alternative is effective in reducing the amount of targeted recyclable materials in the industrial/roll-off and self-haul portions of the waste stream.

Hazard. High. Since this form of salvaging requires waste generators to segregate materials according to the requirements established by the program operators, little or no labor would be required on the part of the program operators to segregate materials before processing and distribution to markets. As a result, there would be much less risk of injury to salvage program workers compared to programs for which labor is required to segregate materials at the solid waste facility.

Ability to Accommodate Change. High. Salvaging at disposal or transfer facilities is adaptable to changes in the targeted materials and segregation requirements. However, these changes may require public education programs and a development phase.

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

Implementation Period. High. A form of this alternative is an existing program at both the San Martin transfer station and the Pacheco Pass landfill.

Facility Requirements. High. This alternative can usually be integrated into existing landfill operations. A form of this program is already occurring at the landfill and transfer station. No additional facilities are needed for this alternative.

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

Institutional Barriers. High. No institutional barriers are known.

Estimated Cost. High. The salvage program described here would require that the tipping areas for salvage have staff present in order to enforce the material segregation requirements established for the program. Ideally, the salvage areas would be located together such that one

staff person could monitor all unloading of materials intended for salvage. Other program costs, if any, are assumed to be offset by revenues from the salvaged materials and the modified tipping fee rate structure. Assuming that two additional staff positions would be required at the landfill, the additional cost of the program would be approximately $60,000 per year.

End Uses. See Section 4.6.6, "Market Conditions."

Public vs. Private Operations. The landfill operator would be responsible for receiving, collecting, processing, and marketing of the material received at the landfill.

4.5.3 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. Low. Additional drop-off centers in the City of Morgan Hill would have a minor effect on reducing the amount of targeted material(s) in the residential solid waste stream. Given the fact that the City has drop-off/buy-back opportunities available for residents (see Section 4.4, "Existing Conditions Description") additional drop-off programs would likely not be highly effective. For the small volume businesses, however, drop-off centers may be effective; this depends on whether they are part of a larger program.

Hazard. Medium. 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. Medium. Drop-off recycling centers are moderately flexible, in that material types can be added quickly, as new markets develop.

Consequences to the Waste Stream. Medium. 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. High. This alternative could be implemented in the short-term planning period (1995).

Facility Requirements. Medium. 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. High. Drop-off recycling centers are consistent with City plans and policies when located within properly zoned areas.

Institutional Barriers. Medium. Frequently, businesses and property owners are reluctant to locate drop-off bins in their parking lot, primarily due to problems that can result if these drop-off areas become dump sites. For this reason, the drop-off programs could not operate in locations without the businesses' and property owners' approval and cooperation.

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

End Uses. See Section 4.6.6, "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.

4.5.4 Other Program Considerations

A. Zoning and building code practices. The City is aware of 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. In addition, the City will consider 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.

B. Solid waste disposal rate structure. The disposal rate structure in the City will be modified in the medium term (1996-2000) in order to encourage participation in recycling programs. A complete evaluation of rate structure modifications is presented in Section 3.4.1.

C. Methods to increase markets. Local procurement programs will be implemented and are discussed in Section 3.4.4. The City will also look to the State for markets developed at that level through the CIWMB.

D. Handling methods. Because the City recognizes the necessity of preserving the integrity of recovered materials for end use, it will source separate recyclable materials through its selected collection programs. The City, through its garbage hauler, will consider re-routing commercial collection in order to preserve the integrity of recyclables. Re-routing can enable a separate collection of wet wastes from grocery stores, for instance, and dry wastes from other businesses.

4.6 Selection of a Recycling Program

In selecting among alternatives, the City of Morgan Hill 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.

4.6.1 Alternatives Selected

Short-Term Planning Period.

The following selected recycling programs will divert approximately 9.1 percent of the total waste stream in the short-term planning period:

Residential alternatives

Residential curbside collection program for recyclables. This program will result in diversion of approximately 3.2 percent of the total waste stream for the following materials: aluminum and tin cans, PET, HDPE, polystyrene foam, corrugated cardboard, newspaper, CA redemption and other recyclable glass. All residential refuse customers (approximately 7,300 customers who receive curbside refuse collection) will receive biweekly recycling collection service.

Source-separated recycling program for multi-family dwellings. This program will result in 0.8 percent diversion of the total waste stream for the following materials: aluminum and tin cans, PET, HDPE, polystyrene-foam, newspaper, corrugated cardboard, CA redemption and other recyclable glass.

Non-Residential Alternatives

Commercial recycling program. This program will result in 2.1 percent diversion of the total waste stream from corrugated cardboard recycling.

Salvage at solid waste facility program. A salvage program will be continued for recyclable or reusable materials hauled to the San Martin transfer

station and the Pacheco Pass Landfill. Expanding this program will result in an additional 3.0 percent diversion of the total waste stream from Morgan Hill for the following materials: Ferrous metals and inert solids.

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

Commercial recycling program. This program will result in additional diversion (7 to 8 percent) of the total waste stream for the following materials: mixed paper, newsprint, magazines, high grade paper, CA redemption and other recyclable glass, aluminum cans, tin cans, ferrous metals, wood, and inert solids.

Manual/mechanized material recovery operation. This facility will receive and process commingled recyclable materials collected through residential and commercial recycling programs. This option will not divert materials in addition to the other identified programs. A MRF would be used to process the collected materials. SVRD is planning to expand the San Martin Transfer Station to accommodate increased resource recovery. The City, through its franchise agreement with SVRD, will have use of this facility.

4.6.2 Applicable End Uses

Please see Section 4.6.6 "Market Conditions."

4.6.3 Handling and Disposal Methods

Please see Section 4.5.4, "Other Program Considerations, Part D"

4.6.4 Facilities to be Utilized for Implementation Short-Term Planning Period

During the short-term planning period, the residential and multifamily recycling programs are designed as conventional bottles, cans, plastics, corrugated cardboard and newspaper collection programs so that a material recovery facility would not be required. The salvage at solid waste facility

program represents an extension of the existing diversion program at the Pacheco Pass landfill and San Martin transfer station. See Section 4.5.2 for a description of the program.

4.6.5 Contingency Measures

In the event of unfavorable market conditions or changes in facility availability which could prevent the City from meeting its diversion goals, the City plans to employ the following measures

- 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.
- locate markets or end uses not previously found, both on a local level and beyond.
- establish a contingency plan for available facilities

4.6.6 Market Conditions

Recycling requires more than the separation and collection of materials; viable markets must exist for the recovered materials. This section addresses the existing market conditions relevant to the City of Morgan Hill, 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, or on its own. Resources exist which identify local markets for different materials; for example, lists are 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 is anticipated to be fully operational by mid-1992, and will include information on markets in California.

Old Newspaper (ONP). Old Newspaper is the main grade of waste paper collected in the residential sector. A number of ONP markets are available

in northern California, including the South Bay. Currently, the amount of ONP that is available nationwide for recycling far exceeds the demand. However, this situation is expected to change. It is estimated that the demand for ONP will almost double by 1995 due to increases in exports of ONP, increases in the paper board market, and other factors.

Because ONP is contaminated with printing inks, it is necessary to deink 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 deink the newspaper or reuse it. The deinking capacity in the United States is expected to increase in the future to meet the anticipated demand and help balance the market.

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

Current market prices paid for ONP in California range from $25 to $40 per ton. However, the market price for ONP is cyclical due to decreased collection in the winter months, paper mill shutdown for maintenance repair in the summer months, economic conditions, international exchange rates, and other factors.

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 lowered 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 nearest Smurfit location for Morgan Hill is in Oakland. 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.

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 to Morgan Hill is in Stockton.

Mixed Waste Paper (MWP). As implied in its name, MWP refers to a paper stream containing more than one grade of paper. MWP 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 MWP. A strong dollar overseas means a decrease in the demand for MWP. Secondary markets for recovered paper can be found in the U.S and abroad. MWP export has increased significantly and has allowed for growth in MWP recycling, particularly in the western United States. Local domestic markets, however, are fairly well saturated. Potential buyers for MWP in the Bay Area include: Weyerhauser in San Jose and DAI El Papers USA Corporation in Burlingame, but other markets need to be identified in order for recycling of MWP to be feasible in Morgan Hill.

The primary use of MWP is in the manufacture of combination boxboard which is used to make boxes for shoes, clothing, and dry foods. Other uses for MWP 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 Morgan Hill are Jefferson Smurfit and Weyerhauser in San Jose and DAI El Papers USA Corporation in Burlingame.

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[3] 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.[4] Steel can recycling is expanding, due in part to increased participation by steel mills and detinning mills in collecting and purchasing used steel cans.[5] This is despite aggressive efforts by the aluminum can industry to enter the steel-dominated food can market.[6]

The major detinning companies have opened new facilities around the U.S. to accommodate the influx of steel cans and the demand from the

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

4 Watson, p. 18.

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

6 Misner, p.70.

steel industry. This has helped decrease transportation distances for recyclers.[7]

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. In addition, cullet is ground into sand at Zanker Road Landfill in San Jose, for use as daily cover and other applications.

Two potential markets for recovered glass in Morgan Hill are Golder State Glass Recycling in Newark and California CRINC in San Leandro. Neither charges a processing fee to take the materials. The glass market has become problematic for many recyclers recently due to 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 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

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

PET is compounded, extruded, and molded plastic makers. BFI has a national contract with Wellman, Inc. for PET, although PET collected in California is not sent to Wellman.

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, antifreeze containers, etc.

Low-density polyethylene (LDPE). 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.[8] It is also used in the manufacture of rigid items, such as food storage containers and flexible lids.[9] 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.[10]

Some local markets for LDPE are Bay Polymer 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.[11]

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

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

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

11 "Dow and Sealed Air Join to Recycle LDPE Scrap," by Susan Combs, *Recycling Times*, January 29, 1991, p. 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. One potential drawback to polystyrene collection is that the material occupies a high volume in collection vehicles and storage areas relative to its low weight.

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.

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.

4.7 Recycling Program Implementation

4.7.1 Agencies Responsible for Implementation

Agencies responsible for implementation are shown in Table 4-2. Additional staffing will be needed to implement the selected recycling programs. The City will add one staff position in 1992 to implement recycling and composting programs.

4.7.2 Implementation Tasks

Implementation tasks are shown on Table 4-2.

4.7.3 Short-term and Medium-term Planning Period Implementation Schedule

Implementation schedule is shown on Table 4-2.

4.7.4 Implementation Costs

Estimated annual costs for the residential collection, multifamily collection, commercial collection, and salvage programs are $149,000, $37,000, $64,000 and $47,000, respectively. The total estimated annual costs for implementing the recycling program are $297,000 for programs to be implemented during the short-term planning period. These costs include the amortization of capital costs and revenue offsets from the sale of recovered materials. These costs do not include education and public information costs or costs for the recycling coordinator (Environmental Programs Assistant). Implementation costs are shown in Table 9-1.

4.7.5 Actions Planned to Deter Scavenging

AB 939 prohibits scavenging from material set out for recycling. However, the most effective means for deterring unauthorized removal of recyclable materials is through an ordinance prohibiting this activity.

4.8 Recycling Program Monitoring and Evaluation

The City recognizes the need to monitor and evaluate recycling programs in order to ascertain whether diversion goals are being met. The following section includes the steps that will be taken to monitor and evaluate the selected recycling programs.

4.8.1 Methods to Quantify and Monitor Achievement of Objectives

The following tasks will be used to effectively monitor the success of the recycling programs. Solid waste diversion will be quantified by tons.

Recordkeeping. Reports on the recycling programs will include the number of participating households and a breakdown of the materials collected. Accurate recordkeeping will be the key to determining whether recycling objectives are being met. The City will also work with the commercial hauler to track progress made in non-residential recycling programs. The City will also monitor its share of diversion attributed to the

self-haul and industrial roll-off diversion program (Salvage at Solid Waste Facility).

Waste generation study. A future waste generation study, required under AB 939, will be conducted in order to gauge the changes in the City's waste stream and the effectiveness of the recycling programs. However, the amount of effort, timing and cost of this study are not clear from the present regulations.

Surveys. Mailed questionnaires or telephone surveys will be conducted approximately yearly, with sample groups from both the residential and commercial/industrial sectors to determine (a) the awareness level about recycling programs, and (b) among those already participating, what the satisfaction level is. For instance, are recycling programs convenient? Are they being used to their capacity? Through the surveys, obstacles to recycling can be identified and participation increased.

4.8.2 Criteria for Evaluating Program's Effectiveness

The effectiveness of each recycling program will be evaluated using the following written criteria.

- **Achievement of recycling objectives**
- **Total solid waste collected.** Through the recordkeeping system and the waste generation study, a determination will be made as to whether the program is successful in achieving the estimated reduction in solid waste volume and weight.
- **Participation rate.** Regular surveying of residents and businesses will give the City an idea about the numbers of residents and businesses participating in recycling programs over time. An increase in the number of households or businesses participating over time is one measure of the success of these programs.
- **Adherence to implementation schedule**

4.8.3 Parties Responsible for Monitoring, Evaluation, and Reporting

The Morgan Hill Community Development Department will oversee the monitoring and evaluation of recycling programs and will be ultimately

responsible for their execution. In addition, the City will work closely with South Valley Refuse and Disposal and other independent recyclers to keep up-to-date about program changes, new programs, etc., which could potentially impact waste diversion goals.

4.8.4 Monitoring and Evaluation Funding Requirements

A budget will need to be set aside for the follow-up waste generation study and for surveying costs (primarily staff time) and printing/mailing costs for questionnaires. Annual monitoring costs in the short term planning period for the selected programs are given in the "Funding Component," Section 9, Table 9-1, and are approximately $13,000 per year.

4.8.5 Measures to be Implemented if Monitoring Shows a Shortfall

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.

Table 4-1
Evaluation of Alternatives

Program Alternatives	Evaluation Criteria					
	Effectiveness	Hazard	Ability to Accomodate Change	Consequences to the Wastestream	Implementation Period	Facility Requirements
RESIDENTIAL						
Alternative 1 Curbside Collection	High	High	Medium to High	High	High	Low
Alternative 2 Mobile Collection System	Medium	High	Medium	High	High	Medium
Alternative 3 Buy-Back Center	Low	High	High	High	High	Low
Alternative 4 Multi-Family Program	High	Medium	Medium	High	High	Medium
COMMERCIAL						
Alternative 1 Commercial/Industrial Program	High	High	Medium	High	High	Low
Alternative 2 Manual/Mech. Material Recovery	High	Medium	Medium	High	Medium	Low
Alternative 3 Salvage Program	High	High	High	High	High	High
OTHER PROGRAMS						
Alternative 1 Drop-off Recycling Center	Low	Medium	Medium	Medium	High	Medium

Table 4-1 Continued
Evaluation of Alternatives

Program Alternatives	Evaluation Criteria				
	Consistency with Local Plans and Policies	Institutional Barriers	Estimated Cost ($)	End Uses	Public/Private
RESIDENTIAL					
Alternative 1 Curbside Collection	High	High	Medium to Low	N/A	Public or Private
Alternative 2 Mobile Collection System	Low	Medium	Medium	N/A	Public or Private
Alternative 3 Buy-Back Center	Medium	Medium	Medium to Low	N/A	Private
Alternative 4 Multi-Family Program	High	Medium	Medium to Low	N/A	Public or Private
COMMERCIAL					
Alternative 1 Commercial/Industrial Program	High	Low	Medium to Low	N/A	Public or Private
Alternative 2 Manual/Mech. Material Recovery	High	Low	Low	N/A	Public or Private
Alternative 3 Salvage Program	High	High	High	N/A	Private
OTHER PROGRAMS					
Alternative 1 Drop-off Recycling Center	High	Medium	Medium	N/A	Public or Private

Table 4-2
Calendar of Recycling Tasks*

Program	Implementation Tasks	Start Date	Responsible Entity
Curbside Collection Program	With SVRD, determine method of collection; determine equipment needed, identify end markets for materials	Mid-1992	Community Development Department
	With SVRD, implement program and temporary MRF if required. Publicize to residents	Mid-1992	Community Development Department
Source separated recycling program: multi-family dwellings	With SVRD, determine method of collection and equipment needed	Late-1992	Community Development Department
	With SVRD, set up pilot program to gauge best type of program and a matching temporary MRF, if required	Mid 1993	Community Development Department
	With SVRD, expand to full-scale	Early 1994	Community Development Department
Commercial/industrial recycling program	With SVRD, determine method of collection and equipment needed	Late-1992	Community Development Department
	With SVRD, set up pilot program to gauge best type of program and a matching temporary MRF, if required	Mid 1993	Community Development Department
	With SVRD, expand to full-scale	Early 1994	Community Development Department
Manual and mechanized material recovery operations	Formalize contractual agreements with SVRD for MRF	Early 1995	Community Development Department

*Includes new or expanded programs as identified in Section 4.6

Table 4-2
Calendar of Recycling Tasks
(Continued)

Program	Implementation Tasks	Start Date	Responsible Entity
Salvage at Solid Waste Facilities	Coordinate with SVRD through the City's franchise agreement to increase salvage operations of the transfer station	Late-1992	Community Development Department
Expand curbside, multi-family, and commercial/industrial recycling programs	With SVRD, evaluate which materials to add to the various collection programs	Early-1996	Community Development Department
	With SVRD, make changes to the collection systems (co-collection) so as to be compatible with the MRF	Late 1997	Community Development Department

5 COMPOSTING COMPONENT

5.1 Introduction

Composting is the controlled biological decomposition of solid organic materials. Such materials include leaves, grass clippings, and other organic materials commonly found in the municipal waste stream. The end product of composting is a stable humus or soil-like material that can be used as soil conditioner, mulch, or fertilizer, depending on its physical properties. The benefits of applying compost to the soil include improved soil fertility, water-holding capacity, and erosion control. Although biological decomposition occurs naturally, several physical and chemical parameters must be controlled to maximize the rate of microbial activity and to minimize environmental impacts. These factors include temperature, oxygen, nutrient availability, moisture, and pH. With proper controls, composting can occur rapidly, yield a marketable product, and reduce the original volume of the organic material by 50 percent or greater.

Composting can play a key role in an integrated waste management program. Composting such waste can significantly reduce the amount of waste that goes to landfills or other disposal facilities. It also allows for more efficient waste collection and reduces gas and leachate problems associated with the landfilling of organic wastes. Composting activities can take place at the site of generation, i.e., backyard composting, or at a centralized facility. Backyard composting is considered a source reduction activity according to the *Planning Guidelines and Procedures for Preparing and Revising Countywide Integrated Waste Management Plans* and is discussed in Section 3 of this document.

Yard wastes have been found to make up a large percent of the waste disposed in the City, comprising approximately 17.7 percent by weight. This has made composting an obvious choice as a focus for meeting AB 939 diversion goals. This component presents composting objectives

for the City of Morgan Hill and identifies existing and proposed activities for achieving these objectives.

5.2 Objectives

The City's composting objectives, which apply to both short-term and medium-term planning periods, are as follows:

- Divert yard waste from the County landfills through composting.
- Promote diversion techniques that emphasize the separation of organic wastes from the municipal waste stream.
- Develop local public and private sector markets and uses for compost in the short-term (1995) and medium-term (2000) period.
- Develop a yard waste drop-off program at the San Martin transfer station and the Pacheco Pass landfill or provide alternative drop-off sites for yard waste in the short-term (1995).
- Implement a curbside collection program for yardwaste in the medium-term (2000)
- Evaluate the use of alternative feedstocks in the composting process.

5.3 Existing Conditions Description

The City has not initiated any market development activities, local government procurement programs, economic development activities, or consumer incentives for compost. No composting programs will be decreased or phased out in the short- or medium-term planning periods.

There are no known public or private composting operations in Morgan Hill. Backyard composting by private residents is considered a Source Reduction activity and is addressed in Section 3 of this document. The City's franchise hauler, South Valley Refuse Disposal, Inc. (SVRD) has in the past segregated yard waste from incoming loads at the San Martin transfer station and the Pacheco Pass landfill. However, this activity has been discontinued as a formal program due to the difficulty in keeping contaminants out of the incoming compost feedstock. SVRD has indi-

cated that a formal yard waste processing and composting program could be developed and implemented at their facilities if proper programs for separation and collection of yard wastes were in place.

5.4 Waste Materials Targeted for Diversion

Yard wastes constitute approximately 17.7 percent of the total disposed waste stream. The generation of yard wastes in Morgan Hill is distributed between the residential (35 percent), commercial (24 percent), industrial (4 percent), and self-haul (34 percent) generators. SVRD currently segregates wood waste from incoming loads and chips the material for use as hog fuel for transformation. The diversion of this wood material by transformation does not, however, count toward AB 939 diversion goals for the short-term planning period.

Composting alternatives targeting yard wastes are evaluated in Section 5.5

5.5 Evaluation of Program Alternatives

This section presents an evaluation of alternative composting programs that can be used by the City to meet the composting objectives. The following alternatives were evaluated based on the evaluation approach described in Appendix A. As presented in Section 18733.3 of Article 6.2 of Title 14, the evaluation criteria are as follows:

- Effectiveness
- Hazard
- Ability to accommodate change
- Consequences on the waste stream
- Implementation period
- Facility requirements
- Consistency with local plans and conditions
- Institutional barriers
- Estimated cost
- End uses

For each evaluation criterion, a rating of high, medium, or low is assigned, and a discussion of potential issues is given. The rating results of the evaluation are summarized in Table 5-1.

As structured by the regulations governing AB 939, some of the criteria by which the alternatives are required to be evaluated are positive in tone (e.g., effectiveness) while others are inherently negative (e.g., hazard). A high rating for a positive criterion implies a positive rating; and consequently a high rating for a negative criterion corresponds to few or no impacts associated with this potential problem.

Composting alternatives for the City are described below. Many of these activities are complementary to each other and depend significantly on the implementation of other alternatives and programs presented in the Source Reduction, Recycling, Composting, Special Waste, and Public Information components of this SRRE. Where possible, these relationships have been indicated in the criteria for evaluating the alternative. An additional consideration in evaluating alternatives is that their effectiveness and impact need to be considered on the basis of how several alternatives will work together as a system, rather than as alternatives independent of one another.

Every composting program consists of three parts: collecting the organic materials, processing these materials, and marketing the finished compost product. In some instances, each of these parts may be selected for implementation independently and without consideration of the others. However, the choice of other alternatives may depend on the options previously selected. In order to provide a logical and consistent evaluation of each of the various combinations of options, collection alternatives will be presented and evaluated separately before evaluating processing alternatives. A complete program, which consists of both a collection and processing option, will be selected in Section 5.5, "Selection of Composting Program." This effectively avoids the dilemma of evaluating collection and processing systems against one another, when in fact they must be combined in order to establish a successful composting program. The markets, or end uses, are discussed in Section 5.4.3.

The City evaluated the following alternatives and related options to effectively divert its compostable material from landfill disposal or transformation.

- ALTERNATIVE 1. Implement Collection Alternatives

  Option 1. Establish a residential yard waste collection program

  Option 2. Develop a commercial/industrial yard waste collection program

  Option 3. Collect alternative compost feedstocks

  Option 4. Yard waste drop-off program

  Option 5. Collect MSW compost feedstock

  Option 6. Enact a City ordinance to ban yard waste from disposal.

- ALTERNATIVE 2. Implement Processing Alternatives

  Option 1. Develop a windrow composting system

  Option 2. Develop an in-vessel composting system

An evaluation of alternatives is presented in the following sections. A summary of evaluation results is given in Table 5-1.

5.5.1 Alternative 1. Implement Collection Alternatives

The collection alternatives are presented below. A number of options have been evaluated, including the separate collection of compostables from the sources of generation (e.g., residential, commercial, industrial, or self-haul sources) and the collection of various compost feedstock materials. Each of the options also requires a processing alternative for implementation. See Alternative 2 for a discussion of the processing alternatives.

Option 1. Establish a residential yard waste collection program. This option proposes that a residential curbside program be established to enable the production of compost from the collected material.

Important considerations in evaluating a residential collection program include the method of set-out for yard wastes, the type of collection vehicles used, and the frequency of collection. While the implementation of one yard waste collection practice over another is not anticipated to have a measurable impact on the quantities collected, differing advantages, such as costs, labor, or flexibility, may be gained. Collection practices

could include loose collection, containerized collection, or a bag collection system. A brief description of each of these methods follows.

A loose yard waste collection system, utilizing a packer truck and a "claw", could be implemented in the City. The claw, referring to a mechanical claw attached to a wheel loader, gathers up loose yard waste placed next to the curb and deposits it into the packer truck. A minimum two-person crew is required for this operation. This option is usually conducted in conjunction with a street-sweeping service to dispose of remaining debris. The claw may drop or be unable to grab up to 10 percent of the leaves and grass set out. The advantages of this system include the easy visibility of contaminants in the yard waste, mechanized lifting to avoid strain on the collection crew, convenience for residents in not being required to containerize their yard waste, and no debagging required during processing. This system has been successfully implemented in Sacramento, Davis, and San Jose, California.

Containerized collection requires that residents place their yard waste into reusable rigid containers for collection. This option proposes that residents provide their own containers, using guidelines established by the City and labeled with City-provided signs to distinguish them from ordinary trash containers. The advantages of a containerized collection system include compatibility with existing collection vehicles and no debagging required during processing. The City could provide containers for a rental fee. This system has been successfully implemented in Palo Alto, California.

The bag collection system is very much like the containerized collection system, however plastic or heavy-duty compostable paper bags would be used. This option proposes that the City provide residents with such bags. The paper bags are weather-resistant and made of two-ply, 50-pound kraft paper coated with a water-proof, non-toxic adhesive. For both types of bags, a 30-gallon capacity bag should be used. The use of paper bags may be more convenient than plastic bags as they have less of a tendency to split open. In addition, plastic bags must be removed during yard waste processing. Shredding the paper bags during processing is not a problem. Paper bags are then simply composted along with the yard waste. The advantages of a bag collection system include little behavioral change required from the residents and compatibility with existing collection vehicles.

This option meets the component objective of promoting diversion techniques that emphasize the separation of organic wastes from the municipal waste stream and facilitates the diversion of yard waste from landfills through composting.

Effectiveness. High.[1] Residential yard waste makes up approximately 5.7 percent of the jurisdiction's total waste stream (not including self-haul yard wastes which are an additional 5.9 percent). It is anticipated that approximately 877 tons or 2.8 percent of the total waste stream could be diverted through a residential yard waste curbside program.

Hazard. High.[2] Potential hazards associated with this option are minimal. Normally, fire hazard is low; however, some risk may be associated in the loose collection practice with automobile catalytic converters starting yard debris on fire. Crew-member injuries could result from lifting heavy bags if bags are used.

Ability to Accommodate Change. Medium. Public acceptance for this option is anticipated to be moderate. Blowing yard debris or parking problems associated with yard waste piles located at the curb may be anticipated in the collection of loose yard waste. Some residents may object to being required to provide their own container for yard waste and may have trouble fitting brush and branches into the container. Changing technologies are unlikely to affect the feasibility of this option. However, seasonal variations probably have a larger effect than variations in economic, technical, and/or social conditions.

Consequences on the Waste Stream. High.[3] This option does not significantly shift solid waste generation from one type of solid waste production to another. Paper bags would be composted along with the yard waste. Rigid containers would be reused. While plastic bags would be discarded, this is not anticipated to contribute significant quantities to the waste stream.

Implementation Period. High. This option could be implemented in either the short-term or medium-term planning period.

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1 Refers to relative rating of the alternative with respect to this criterion.

2 Note that several of the criteria--hazard, institutional barriers, and consequences on the waste stream--are inherently negative. A rating of high for these criteria corresponds to few or no impacts associated with these potential problems.

3 See footnote 2.

Facility Requirements. Medium. Regarding the collection of yard waste from residences, facility needs are those associated with a truck fleet. Additional trucks may be needed unless the yard waste collection operation can use the same trucks as are required for the collection of other portions of the waste stream. In order to produce compost, this option also depends on the development of a composting facility. See Alternative 2 for discussion of the proposed facility options.

Consistency with Local Plans and Policies. High. This option is consistent with local policies and does not affect existing plans or ordinances.

Institutional Barriers. High.[5] The City's current contracts and agreements will have to be considered in implementing this option.

Estimated Cost. Medium. A packer truck and a wheel loader with claw attachment will be needed for the loose collection system; although, conventional packer trucks from existing fleets could be utilized. The cost of a packer truck could range from $63,000 to $168,000, depending on the capacity required. The cost of a wheel loader could range from $40,000 to $168,000, with the mechanical claw attachment adding an additional $7,000 to $11,000. Operational and maintenance costs are anticipated to be moderate. The containerized and bag collection systems will require few additional costs. For example, compostable paper bags, as described above, cost approximately $0.29 each. Per ton collection costs are expected to be in the range of $80 to $110 per ton of collected yard waste.

End Uses. N/A. End uses are discussed in Section 5.4.3.

Option 2. Develop commercial/industrial yard waste collection program. Option 2 involves the development of a yard waste curbside collection program to include selected commercial and industrial businesses. Separate bins would be provided for each participating customer. Yard waste collection vehicles would deposit the yard wastes at the site of the proposed compost processing facility. Only companies that regularly dispose of significant quantities of yard waste would be targeted for this program. The advantages of a containerized collection system include the compatibility of existing collection vehicles and no debagging required during processing.

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5 See footnote 2.

This option meets the composting goal of promoting diversion techniques that emphasize the separation of organic wastes from the municipal waste stream and facilitates the diversion of yard waste from landfills through composting.

Effectiveness. High. Commercially generated yard waste consists of 3.9 percent of the total waste stream. Providing bins for separate collection of yard waste from yard waste-generating businesses could divert 2 percent of the waste stream.

Hazard. High. No potential hazards are associated with this option.

Ability to Accommodate Change. Medium. Public acceptance for this option is uncertain. Changing technologies are unlikely to affect the feasibility of this option. As a collection program, this option would have the flexibility to adjust to changing waste quantities, though seasonal variations probably have a larger effect than variations in economic, technical, and/or social conditions.

Consequences on the Waste Stream. High. This option does not shift solid waste generation from one type of solid waste to another.

Implementation Period. High. This option could be implemented in either the short-term or in the medium-term planning periods. Some difficulties in implementation may be encountered in the short run due to lack of additional bin space at some commercial and industrial businesses.

Facility Requirements. Medium. Collection vehicles would be required for this option in servicing participating businesses; however, conventional packer trucks could be used. Additional bins and program monitoring would also be required. In order to produce compost, this option depends on the development of a composting facility. See Alternative 2 for discussion of the proposed facility options.

Consistency with Local Plans and Policies. High. This option is consistent with local policies, plans, and ordinances.

Institutional Barriers. High. A lack of space in existing buildings may prevent the placement of additional bins at some locations. The City's current contracts and agreements will have to be considered in implementing this option.

Estimated Cost. Medium. Additional collection vehicles and bins would be required for this option in servicing participating businesses. Additional

costs would be involved with separate collection of yard waste. However, the incremental costs of adding yard waste collection to the existing refuse collection system are less than the costs of considering each of these separately. While the addition of yard waste collection would increase the collection services required, it would decrease the quantity of refuse to be collected. This could perhaps result in a decreased refuse collection frequency from three times per week to only two, for example. Depending on exact quantities and collection methods, additional collection costs could increase collection costs by 5 to 20 percent.

End Uses. N/A. End uses are discussed in Section 5.4.4.

Option 3. Collect alternative feedstocks. This option involves the collection of alternative feedstocks, including such wastes as food wastes diapers, other paper, sewage sludge, or manure. One or more of these waste types would then be transported to a processing facility to be co-processed with yard wastes into a high-grade compost product. The advantage of a co-composting system is the potential of producing a higher-grade compost than could be produced from yard waste alone.

Food wastes could be separately collected from commercial businesses such as grocery stores, restaurants, and packing houses. One method of collecting food waste would be to provide special food waste containers to participating businesses. Alternatively, some degree of separation may be possible through rerouting practices in order to collect wastes from food waste generators (predominantly wet wastes from restaurants and grocery stores) separately from the generators of paper wastes (predominantly dry wastes), for example. This rerouting method would result in collecting smaller quantities of food wastes that would have higher levels of contamination than through the use of special containers. By separating out the wet wastes, both methods offer the potential advantage of decreasing the contamination of recyclable paper.

Loads of sewage sludge and manure could also be diverted to the processing facility for composting. These wastes are currently generated separately from the municipal waste stream. Although only minimal amounts of manure are generated within the City, manure generated in adjacent County areas could be sought as a feedstock for the co-composting process.

This option must be selected in conjunction with a yard waste collection program in order to provide the co-feedstock for the composting process.

This option may be implemented by the City, a City contractor, the City's franchise hauler, or in cooperation with one or more nearby jurisdictions.

This option meets the component objectives of promoting diversion techniques that emphasize the separation of organic wastes from the municipal waste stream and evaluating the use of alternative feedstocks in the composting process.

Effectiveness. Low. A program capable of collecting one-half of the food waste that is being landfilled from commercial sources would divert about 1.8 percent of the total waste stream. Larger quantities are possible if food and certain grades of paper were also targeted from the residential waste stream. Minimal amounts of manure are generated within the City. The diversion of sewage sludge does not currently count toward the City's 1995 or 2000 diversion goals according to the *Planning Guidelines and Procedures for Preparing and Revising Countywide Integrated Waste Management Plans*. Yard waste diversion quantities are countable and are described under the yard waste collection program selected in conjunction with this option.

Hazard. High. Assuming that the wastes would be properly and completely composted, there are no additional health hazards associated with this option, provided that current regulations regarding the collection and storage of food wastes are adhered to. Composting such wastes in an open windrow system would increase potential vector problems and could cause significant odor problems. For further discussion on this issue, see Consistency with Local Plans and Policies.

If manure and/or sewage sludge were obtained from outside of Morgan Hill as co-compost feedstock, it is important that the materials be completely and properly composted in order for the human pathogens that may be present in the sludge or manure to be destroyed. For most composting processes, complete pathogen destruction cannot be guaranteed. In addition, trace metals or chemicals in manure or sludge may result in undesirable compost characteristics. As a result, end uses for the compost product could be limited to certain types of plant and crop propagation, for use in orchards for example. Testing of manure or sludge for undesirable metals and chemicals would reveal potential market limiting problems.

Ability to Accommodate Change. High. Public acceptance for this option is uncertain. Changing technologies are unlikely to affect the feasi-

bility of this option. A food-waste collection program provides the necessary feedstock to develop a high-grade, readily marketable compost. A sewage sludge or manure collection program provides the necessary feedstock to develop a high-grade compost, though perhaps with limited marketability.

Consequences on the Waste Stream. High. This option does not shift solid waste generation from one type of solid waste to another.

Implementation Period. Medium. This option would be implemented in the medium-term planning period.

Facility Requirements. Medium. Additional collection vehicles and dedicated containers (bins) may be required if a food waste collection program is developed. Adding feedstocks such as sludge and food waste makes an in-vessel composting system preferable. This option is dependent on the development of a yard waste collection program and a composting processing facility.

Consistency with Local Plans and Policies. High. This option is consistent with local policies, plans, and ordinances.

Institutional Barriers. Medium. Alternative handling and storage procedures for food wastes must be implemented by participating businesses. A lack of space for additional bins may also restrict the implementation of this option. Currently, AB 939 does not allow the utilization of sewage sludge as a diversion measure. Therefore, AB 939 impacts the decision whether to utilize sewage sludge as a compost feedstock.

Estimated Cost. High to Medium. Additional collection vehicles and bins would be required for this option in servicing participating businesses if a food waste collection program is developed. However, the incremental costs of adding food waste collection to the existing refuse collection system or rerouting the existing collection system are less than the costs of considering each of these separately. While the addition of food waste collection would increase the collection services required, it would decrease the quantity of refuse to be collected for participating businesses. This could perhaps result in a decreased refuse collection frequency from three times per week to only two, for example. Depending on exact quantities and collection methods, additional collection effort could increase commercial collection costs by 5 to 20 percent.

Additional transportation costs may be required for the delivery of sewage sludge or manure, depending on the location of the proposed composting facility.

Costs for the yard waste collection program and the processing system are described with their respective evaluations.

End Uses. N/A. This option provides the necessary feedstock to produce a high-grade compost product, depending on the level of contamination in the sewage sludge feedstock. End uses are discussed in Section 5.4.4.

Option 4. Yard waste drop-off program. This option proposes that the City establish either a local drop off site for yard wastes or a yard waste drop-off program at the landfill. Yard waste is currently being delivered to the transfer station and the landfill in mixed loads. Currently these facilities also accept wood waste which are diverted from the landfill for incineration off site. However, incineration does not count toward the AB 939 diversion goals for 1995.

The drop off program could be expanded to include other convenient locations. Yard wastes could be stockpiled at the drop-off sites until a sufficient quantity was collected, at which time a mobile grinder unit would process the yard waste. These processed materials would then be transferred to the composting site, if the site was located elsewhere. See Alternative 2 for a discussion of the composting facility options. Participation would be promoted by developing an on-going education/promotion program targeting City residents and businesses. For a description of this program see Section 7, "Education and Public Information Component." The primary advantage of a drop-off program is that it can be easily and cost effectively implemented in sparsely populated areas. It is also convenient for those residents and businesses that prefer to self-haul their wastes.

This option meets the component objectives of promoting diversion techniques that emphasize separation of organic wastes from the municipal waste stream, establishing a yard waste drop-off program, and facilitates the diversion of yard waste from landfills through composting.

Effectiveness. Medium. Self-hauled wood and yard wastes make up approximately 11.0 percent of the total waste stream. It is anticipated that this program could effectively divert approximately 6 percent of the total waste stream. The effectiveness of this program would increase if residential and commercial yard wastes were included.

Hazard. Medium. Potential hazards associated with this option include vector and fire hazards due to stockpiling. To date, no significant problems have resulted from stockpiling yard waste at the landfill or transfer station sites.

Ability to Accommodate Change. High. Because the education program would be on-going, the program will be capable of great flexibility in accommodating changing economic, technological, and social conditions.

Consequences on the Waste Stream. High. This option does not shift solid waste generation from one type of solid waste production to another.

Implementation Period. High. This option would be implemented in the short-term and medium-term planning periods.

Facility Requirements. High. Drop-off sites are already available at the transfer station and landfill. However, significant composting facility needs are required to process the yard waste into compost. See Alternative 2 for discussion of proposed composting facilities. For additional program needs, see Section 7, "Education and Public Information Component."

Consistency with Local Plans and Policies. High. This option is consistent with local policies and does not affect existing plans or ordinances.

Institutional Barriers. High. Institutional barriers are anticipated to have little or no impact on this option.

Estimated Cost. High. A yard waste program has been undertaken in the past at the transfer station and at the landfill. Expansion of the program will incur public education costs to promote the program. For discussion of the education/promotion program budget, see Section 7, "Education and Public Information Component."

End Uses. N/A. End uses are discussed in Section 5.4.3.[1]

Option 5. Collect MSW feedstocks. This option proposes the development of a regional municipal solid waste (MSW), or mixed waste, composting program. Loads of residential and commercial waste would be diverted to the composting facility where wastes would be shredded and co-composted with sewage sludge and possibly some other materials, such as manure. Oversized particles would be rejected and landfilled. A

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[1] This section presents a discussion of end uses for compost that applies to the alternatives discussed in Section 5.4.2.

magnetic separator would be used to retrieve ferrous metals from the compost feedstock. After composting, the resulting material would be screened to reduce the concentrations of visible non-compostable materials. See Alternative 2 for a discussion of composting facilities. This facility would process and compost municipal wastes originating from the City and from other jurisdictions in the County. This option may be implemented by cooperation among the neighboring Cities, the County, or a contractor. The advantage of a MSW composting program is that compostable materials do not need to be source separated from the municipal waste stream. Therefore, the existing collection system could remain in place, unaltered. More importantly, the diversion potential under AB 939 regulations is higher for MSW composting than for any other option. A disadvantage is that in comparison to the compost produced with similar processing from some source separated feedstocks, MSW compost would be at a competitive disadvantage in the marketplace.

This option meets the component objective of evaluating the use of alternative feedstocks in the composting process.

Effectiveness. High. Compostable organic materials make up approximately 75.7 percent of the City's disposed of waste stream. An MSW composting system with magnetic separation of ferrous metals in the compost could divert up to 53 percent of the total landfilled waste stream, assuming that 15 percent of the wastestream is bulky, non-processible materials and that 15 percent of the processed material is rejected by the process. Minimal amounts of manure are generated within the City. The diversion of sewage sludge does not count toward the City's 1995 or 2000 diversion goals according to the *Planning Guidelines and Procedures for Preparing and Revising Countywide Integrated Waste Management Plans.* This option collects the necessary feedstock to produce a compost that is generally considered to be lower in grade than composts produced with similar processes from most source separated feedstocks. In order to be effective under the regulations, the program must simply find uses or markets for the compost product that divert the material from being landfilled as a waste product. End uses are discussed in Section 5.4.4.

Hazard. Medium. Assuming that the wastes would be completely and properly composted, there are no additional health hazards associated with this option. However, it is important that this condition be met in order for the human pathogens and chemical contaminants that may be present in the waste, particularly the sludge, to be destroyed. For most compost-

ing processes, complete pathogen and contaminant destruction cannot be guaranteed. In addition, trace metals or chemicals in the feedstocks may result in undesirable compost characteristics. As a result, end uses for all or a portion of the compost product could be limited to certain types of plant and crop propagation, for use in non food crops, for example. In addition, the improper storage and handling of the feedstocks could result in vector and odor problems.

Ability to Accommodate Change. Medium. Public acceptance for this option is uncertain. Changing technologies are unlikely to affect the feasibility of this option. An MSW diversion program provides the necessary feedstock to develop a compost with uncertain marketability.

Consequences on the Waste Stream. High. This option does not shift solid waste generation from one type of solid waste to another.

Implementation Period. High. This option would be implemented in the short-term planning period in conjunction with a processing system.

Facility Requirements. Low. This option relies on the existing collection system and is dependent on the development of a relatively complex composting facility.

Consistency with Local Plans and Policies. High. This option is consistent with local policies, plans, and ordinances.

Institutional Barriers. High. Institutional barriers are anticipated to have little or no impact on this option.

Estimated Cost. High. A small additional collection cost may be involved due to additional transport distance to the central composting facility. However, these additional collection costs would be small in comparison to the various source separation alternatives. Municipal wastes are currently delivered to the San Martin transfer station and the Pacheco Pass landfill. Additional transportation costs may also be required for sewage sludge and manure, depending on the location of the proposed composting facility. Costs for the composting facility are described in Alternative 2.

End Uses. N/A. This option would provide the necessary feedstock to produce a large amount of compost product. Unfortunately, no examples exist in California to provide a guide for product uses in the quantities proposed. End uses are discussed in Section 5.4.3.

Option 6. Enact a City ordinance to ban yard waste from disposal. This option proposes the enactment of a City ordinance to ban yard waste from landfill disposal. A comprehensive ban on yard waste represents an effort to increase the diversion for all yard debris generated by both residents and commercial businesses. In the medium-term period, residents, businesses, and self-haulers would be required to segregate yard waste from their garbage for delivery through the City's hauler or self-hauling to the proposed composting facility, approved drop-off sites, or out of the jurisdiction. There would be a reduced tipping fee for clean loads of yard waste delivered to the proposed composting facility or approved drop-off sites. A yard waste collection program should be established in conjunction with this option.

A total of ten states nationwide, and many counties, have legislation banning at least some types of yard wastes from landfilling. Regulations range from banning only the landfilling of leaves to banning leaves and grass clippings, tree stumps, or all yard debris.

The ordinance could include the following language regarding residential compliance:

> ". . . leaves, grass, prunings, and garden waste cannot be collected with mixed municipal waste if that waste is going to be disposed of or processed in the metro area." Carver County, Minnesota.

The advantage of an enforced yard waste ban is the potential to recover a large portion of the yard waste generated.

This option meets the composting goal of diverting yard waste from landfills through composting, if a composting system is developed in conjunction with this option. However, without regional coordination, a yard waste ban would be problematic since wastes from the City flow to disposal sites that serve more than one jurisdiction in Santa Clara County.

Effectiveness. High. Bans have been demonstrated to be effective in reducing the quantities of yard waste landfilled. During the month directly following the enactment of the yard waste ban in Dakota County, Minnesota, 25 percent more yard waste was delivered to the compost site than the highest rate for any previous month. However, this rate of increase may not apply directly to the City due to site specific factors.

A yard waste ban could divert up to 80 percent of this particular wastestream if implemented in conjunction with one or more collection

options to facilitate participation. In conjunction with a yard waste ban, the residential yard waste collection program could ultimately divert approximately 1,597 tons per year or 5.6 percent of the wastestream. The drop-off program could ultimately lead to the collection of 2,741 tons per year or about 9.6 percent of the wastestream.

Hazard. Medium. Potential hazards associated with this option include vector and fire hazards due to stockpiling or illegal dumping of yard waste.

Ability to Accommodate Change. Low. Public acceptance of this option is uncertain. However, while such a ban has a limited ability to accommodate changing conditions, flexibility is a greater factor of the processing option chosen in conjunction with this option. A collection and processing option must be selected with this option.

Consequences on the Waste Stream. High. This option does not shift solid waste generation from one type of solid waste production to another.

Implementation Period. Medium. This option will be implemented in the medium-term planning period, in order to allow for the prior implementation of one or more collection alternatives.

Facility Requirements. Medium. This option is dependent on the development of a collection program. In addition, a new composting facility is required for the implementation of this option. See Alternative 2 for discussion of proposed composting facilities.

Consistency with Local Plans and Policies. Low. This option conflicts with local policies. In addition, it would conflict with current policies in adjacent cities and at the landfill. An enforcement mechanism would have to be developed for the City since there is no such program in place.

The City could develop a random "audit" policy for enforcement of the yard waste ban. A load-checking program targeting commercial, industrial, and self-haul vehicles would be implemented at the landfill, inspecting vehicles at random to determine compliance. Warnings would be issued prior to a citation. This would be similar to the existing prohibited waste control program at the landfill. However, those audit or load checking programs may not be workable at the landfill without similar laws in most or all nearby jurisdictions.

Institutional Barriers. Low. Without coordination among the other jurisdictions in the County, monitoring and enforcement of the law could be difficult.

Estimated Cost. High. This option could be implemented in conjunction with the existing prohibited waste control program at the landfill at the cost of hiring personnel to examine loads from the City.

End Uses. N/A. End uses are discussed in Section 5.4.3.

5.5.2 Alternative 2. Implement Processing Alternatives

Processing alternatives are presented below. Two options have been developed and evaluated, representing low and high technology approaches to composting. These options also require the selection of collection alternatives for implementation. See Alternative 1 for a discussion of the collection options.

Option 1. Develop a windrow composting system. This option proposes the development of a turned windrow system incorporating pre- and post-processing operations designed to produce a marketable compost. The primary advantage of a windrow composting system is low to moderate capital and operating costs. Disadvantages of windrow composting are requirements for more land than that needed for in-vessel systems and the possible production of objectionable odors. This facility would process and compost waste materials originating from the City. However, the City may choose to cooperate with one or more jurisdictions and the operator of the San Martin transfer station and the Pacheco Pass Landfill (SVRD) in developing a regional processing facility.

In order to speed the composting process, a pre-processing operation is typically performed before composting actually takes place. Pre-processing usually involves shredding and/or screening of the materials received.

Windrow composting systems involve stacking the pre-processed compostable materials in piles with a triangular or trapezoidal cross-section. The turned windrow is the method most commonly used for yard waste composting. "Turning" describes the method of aeration, basically referring to tearing down the pile and reconstructing it so as to re-expose the pile interstices to air. During the active compost stage, materials will be turned 2 to 8 times monthly to increase aeration, utilizing either a wheel loader, an excavator with a special attachment, or a compost turner made espe-

cially for this purpose. If plastic bags are used in collecting the yard waste, turning equipment that has demonstrated effectiveness in removing bags would be desirable. An irrigation system will be used to maintain proper moisture levels. Following a curing period when the compost is sufficiently stabilized, the compost will be subjected to an additional stage of processing (referred to as post-processing) in which the material would be screened and/or shredded in preparation for producing products to market specifications. The fine material passing a screen with approximately 1/4 openings would be transferred to a finished compost stockpile, and oversize material would be either returned to the active compost windrows, shredded, or segregated and marketed as additional products, such as mulch or wood chips.

If alternative feedstocks, such as sludge, manure, or food waste, are to be added to shredded yard waste in the composting process, additional processing is required. For example, after shredding the yard waste, alternative feedstocks would be integrated into the compost feedstock through the use of mixing equipment. These materials would then be co-composted. Additional windrow turning would also be required. If an MSW feedstock is to be composted, pre-processing generally involves shredding, screening, magnetic separation, and possibly air classification and some hand sorting of recyclables. With MSW composting, these operations and a portion of the compost process generally occur within a building under more controlled conditions. A portion of the composting process may involve a variation of the windrow method, referred to as aerated static pile. In this method, air is supplied via positive or negative pressure through a network of pipes or channel in a floor. Alternatively, an in-vessel system may be used for a portion of the composting process (see option 2).

Initially, the program will be operated on a pilot basis accepting only limited quantities of yard waste and possibly some alternative feedstocks. After market experience has been gained and a marketing plan is developed, a full program will follow. It is important for all of the composting equipment and procedures to be fully operational in expanding the program to accept large quantities of yard wastes. Even more importantly, markets and product market specifications should be well understood before expanding beyond the pilot scale.

This option meets the component objectives of diverting yard waste from landfills through composting.

Effectiveness. N/A. This criterion is not applicable to the processing alternatives (See Section 5.4.1, Alternative 1. Collection alternatives).

Hazard. High. Potential hazards associated with this option are minimal. Normally, fire hazard is low, due to the interior moisture content of the composting material. Thus, if the surface materials were ignited, a major fire would be unlikely. Fire safety is improved through the ready availability of water through the proposed irrigation system and the provision of open aisles between windrows.

Ability to Accommodate Change. High. Public acceptance for this option is anticipated to be high. Changing technologies are unlikely to affect the feasibility of the composting program. The process will be designed to produce a marketable product. In addition to creating a desirable consistency, the screening process also reduces visual contamination. Visual contaminants affect the appearance of the compost and include particles of waste, such as glass, plastics, or metals, which decrease the product's marketability.

Consequences on the Waste Stream. High. Screening the compost will create a variety of end-products, including mulch and wood chips. Whether the production and subsequent use of these materials counts toward AB 939 goals (i.e., as diversion) depends on their use. The use of wood chips as fuel, for example, is not allowable under AB 939 as a diversion measure. However, at this time the City's wood fiber is not being composted but is diverted from the waste stream as fuel.

Implementation. High. This option will be implemented in the short-term and medium-term planning periods.

Facility Requirements. Low. This option requires development of a composting site, including the purchase of grinding, turning, and screening equipment for implementation. Necessary equipment includes a loader, grinder, compost turner, irrigation (drip) hoses, hoppers, conveyors, and a screen. Site preparation activities, such as grading for proper drainage, may also be required. Additional labor requirements will be determined. Regular lab analyses of the finished product will increase the products' marketability (See Section 5.4.3 for further discussion of this issue).

Consistency with Local Plans and Policies. High. This option is consistent with local policies, plans, and ordinances. However, permits would need to be obtained from local agencies to operate a composting facility.

Institutional Barriers. High. AB 939 does not allow the use of transformation as a diversion measure for the 1995 goal. Therefore, AB 939 impacts the decision of whether or not to utilize wood chips as fuel.

Estimated Cost. Low. For a facility designed to compost yard waste collected at curbside from City residences and from self-haulers (assumed to be 4,338 tons per year), capital costs are expected to be in the range of $300,000 to $500,000, exclusive of land. Costs could be higher or lower depending on the specific types of equipment purchased and site preparation. Annual operating expenses, which may range from $10 to $30 per ton of incoming feedstock, include labor, fuel, equipment maintenance (parts and labor), and lab analyses. Expressed on a cost-per-ton-of-yard-waste basis, these amortized capital and operating costs would amount to approximately $30 to $60 per ton. If alternative feedstocks or MSW are used to make compost, then unit costs would most likely increase to $40 to $70 per ton, assuming that the City cooperates with several other jurisdictions so that a combined input flowrate can match the capacities of process equipment.

End uses. High. This option produces a variety of compost products and by-products, including composted fines, mulch, and wood chips. The option has the capability of producing a high-quality compost (See also Section 5.4.3.)

Option 2. Develop an In-vessel Composting System. This option proposes the development of an in-vessel bin-type system for the processing of several potential feedstocks. An in-vessel system provides an enclosed or semi-enclosed environment for the composting process. This facility would be best suited to process and compost feedstocks that are highly putrescible, including food, sludge, or MSW. If sludge, food, or MSW feedstocks are to be included, then a processing system capable of mixing, shredding and/or separating materials would be required along with the composting system. The advantages of an in-vessel composting system over a windrow system include lesser space requirements, greater process and materials handling control, reduced labor requirements, shorter composting period, better environmental control, and greater system throughput. The disadvantage is relatively high capital cost.

This facility would process and compost waste materials originating from the City. However, the City may choose to cooperate with one or more

jurisdictions and the operator of the San Martin transfer station and the Pacheco Pass landfill (SVRD) in developing a regional processing facility.

The bin system consists of one or more rectangular troughs into which feedstock is fed by way of conveyor belts. Air may be forced into the composting material through perforations in the floor of the bin. A tiller-like device, in conjunction with a travelling belt, may also be used to mix the material periodically and to discharge the material from the bins. If plastic bags are used in collecting the yard waste, equipment that has demonstrated effectiveness in removing bags would be desirable. After an initial in-vessel composting period, all in-vessel systems require some "curing" or "maturation" time in order for the compost to stabilize.

The retention time of materials in the active composting stage is generally three or four weeks. At that time, materials would be substantially stabilized. Then they will be moved to the curing stage where they will be further stabilized for another four to eight weeks.

An in-vessel system would involve similar pre- and post- processing operations as were described in Processing Option 1, above.

As with the windrow option, a pilot program would be prudent to verify the market for a product produced by a large scale operation, such as that proposed here. However, the pilot program could use a less expensive system to produce a pilot scale product, as long as the pilot products were representative of those to be produced by the full scale operation.

This option meets the component objectives of diverting yard waste from landfills by composting.

Effectiveness. N/A. This is not applicable to the processing alternatives (See Section 5.4.2, Alternative 1. Collection Alternatives).

Hazard. High. There are no potential hazards associated with this option.

Ability to Accommodate Change. High. Public acceptance of this option is anticipated to be high. In-vessel composting has several technological advantages, including excellent capabilities to control the physical parameters of composting (e.g., oxygen content, moisture content, and temperature), high decomposition rates, reduced land requirements in comparison to windrow systems, and minimized environmental impacts. A variety of bin systems are operating successfully in the United States.

Changing technologies are unlikely to affect the feasibility of this option. Post-processing will enhance the marketability of the product. In addition to creating a more desirable consistency, post-processing also reduces visual contamination. Visual contaminants, which affect the appearance of the compost, include particles of waste, such as glass, plastics, or metals; the presence of these contaminants decreases the product's marketability.

Consequences on the Waste Stream. High. Screening the compost during post-processing will create a variety of end-products, including mulch and wood chips (See Option 1. Develop a Regional Windrow Composting System above for further discussion of this issue).

Implementation. Medium. This option will be implemented in the medium-term planning period.

Facility Requirements. Low. In-vessel systems are more machine intensive, thus less labor is required in their operation. A bin-type composting facility must be sited and constructed prior to implementation. This option also requires the purchase of screening equipment for post-processing activities. Necessary equipment includes hoppers, conveyors, and a screen.

Consistency with Local Plans and Policies. High. This option is consistent with local policies, plans, and ordinances.

Institutional Barriers. High. AB 939 does not allow the use of transformation as a diversion measure for the 1995 goal. Therefore, AB 939 impacts the decision whether to utilize wood chips as fuel.

Estimated Cost. Low. The disadvantages of the in-vessel composting system are cost and equipment maintenance. The cost of an in-vessel system can be prohibitive for use in yard waste composting. In addition to significant capital costs, an in-vessel system can also incur large operating costs. Equipment maintenance may be time consuming and costly for an in-vessel system, depending on the equipment and system design. Another disadvantage of in-vessel composting is that economies of scale cause facilities designed for small flowrates, such as that from the City, to operate with high costs per unit of material composted. As a result, an in-vessel system designed for MSW, sludge, or other feedstocks would not be economical for the City alone and would be best designed at a regional scale, such as the entire County. Expressing capital and operating expenses on a cost-per-input ton of yard waste and/or other wastes, an in-

vessel bin system could range from $50 to $90 per ton, if developed at a regional scale.

End Uses. High. This option produces a variety of compost products and by-products including composted fines, mulch, and wood chips. Depending upon the feedstock used, the in-vessel system has the capability of producing a high-quality compost (See also Section 5.4.3.)

5.5.3 End Uses[6]

The availability of compost markets is a key requirement in the successful development of a composting program. Local markets should be identified whenever possible. Transportation costs are also an important consideration, because the greater the distance to market, the higher the price of the product. However, this also works in reducing outside competition when there is a local source available. The price of the product is critical in its marketability.

Potential markets include soil brokers, garden supply stores, agriculture, nurseries, landscape contractors, sod growers, tree farms, and golf courses. On-site direct marketing to residents has not been found to be a reliable end-use. Most homeowners seek a high-quality product in small quantities, usually preferring a bagged product. Residents may lack appropriate containers or means of transport for bulk distribution of the product.

Soil brokers are typically the largest buyers of organic materials on the wholesale market. This market is currently very promising and especially strong for locally produced organic materials. Many of these organic materials currently purchased by soil brokers are transported, sometimes great distances, from lumber mills and other industrial processing facilities. For the most part, local soil brokers rely on imported sawdust, wood chips, bark dust, and bark chips for organic materials. Local production of compost and other organic materials could substitute for the large quantities of imported organic materials.

Public agency markets, although generally smaller than the private sector markets, are also worth considering. The City could implement procurement policies giving preference to the use of compost products in place of

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[6] This section presents a discussion of end uses for compost that applies to the alternatives discussed in Section 5.4.2.

commercial fertilizers and soil amendments when these are purchased. Although City use of these products may be low, the value of such a decision may prove worthwhile, especially in encouraging landscapers and other businesses to use compost products.

The aim of several pieces of legislation passed in California last year was to increase public sector demand for compost. Beginning in 1991, the state's highway landscape maintenance programs will use compost in place of, or in addition to, commercial fertilizers. Beginning in 1993, the state will initiate programs to restore public lands using composted materials. In addition to these measures, any state procuring agency that requests a bid for commercial fertilizer or soil amendment must document the determination that the use of compost was not feasible. Future markets for compost may be identified by a state-funded study evaluating uses for compost. These efforts may further expand markets for the City's compost for use by the Department of Transportation, the Department of General Services, and other state and local public agencies. In addition, the City should evaluate the use of compost for land reclamation uses. These are generally one-time uses and should not be relied on in a long-term market strategy.

Flexibility in production is a key for reliable distribution of the compost product. There is currently demand for a number of different compost grades for a variety of uses. Production of varying particle sizes for the compost product using coarser to finer screens during post-processing, allows better pricing flexibility in meeting differing market needs.

There are at least four distinct products that could result from yard waste processing activities: composted fines, mulch, wood chips, and low-grade compost. The composted fines, a higher grade compost, could be defined as mature compost with 98 percent of the particles passing through a 1/4-inch screen. Mulch consists of either mature composted or uncomposted materials, slightly larger than the fines, ranging from 1/2 to 2 inches in particle size. Wood chips are not composted and can range in size from 1 to 3 inches. Low-grade compost is a product in which there has been no screening to differentiate between the particle sizes described above or one that contains contaminants. The production of uncomposted mulch and wood chips does not involve controlled biological decomposition and therefore is not considered composting under AB 939. However, credit for the diversion of such materials can be given as a form of recycling.

The market for wood chips processed and sold as fuel is exceptional. Even though, this method of diversion constitutes transformation and is therefore not countable toward AB 939 goals, it is a viable alternative to landfill disposal. It will also count 10 percent towards the year 2000 AB 939 goals. Avoided landfill disposal costs, as well as revenues gained from the sale of wood chips, may make this an attractive option. These revenues then could be used to support AB 939 diversion programs. Marketing wood chips for mulch or other landscape dressing is not advisable unless the product is uniform in particle size and is aesthetically consistent in appearance. Bark chips are typically used by landscapers because of the consistency of these qualities, while chipped yard waste tends to appear mottled in color and inconsistent in size. This is primarily dependent on the composition of feedstock and such marketing should be considered if a consistent high-quality material is produced.

Levels of non-compostable contamination, stability, nutrient content, trace metal and chemical compound content, and physical appearance also affect the quality, and thus the marketability, of compost. Market studies have indicated that the quality of the product is a primary concern for commercial buyers. Conducting regular laboratory analyses, including a Soil Fertility and Micronutrient Analysis and an Organic Amendment Analysis, is highly recommended. Laboratory results and testing parameters should be made available to potential buyers to assure them that the finished product maintains consistent levels of quality and content.

The market for compost produced from feedstocks other than yard debris (such as MSW and food-waste compost) may be limited in Morgan Hill and the Bay Area. Although the appearance, consistency, and nutrient content demonstrated by food-waste compost may be preferred by many landscapers and nurseries, its marketability could be limited by health concerns including disease transmission, contamination, and an uncertainty as to its contents. The production of this material has the potential of improving the yield and quality of high-grade compost; however, processing complications perhaps combined with an uncertain reception from potential buyers, may result in a limited ability to distribute the product. Demonstration projects during pilot-scale production may be the best approach to over-coming buyer uncertainty.

There are some risks associated with identifying end uses for compost. The quantity of compost products on the market in California within the next few years is unknown, although it is expected to increase rapidly.

Competition among composting programs in a number of localities could be significant. Although it is too early to project the saturation level of the compost market, flexibility in product specifications and pricing could be the key to a successful marketing strategy. The risks associated with marketing low-grade compost may be somewhat higher than those associated with high-grade compost. Compost marketing is anticipated to be competitive if adjacent regions are also compost-producers. If high-grade yard waste compost is readily available, this will out-compete a program that offers only a low-grade compost product.

5.6 Selection of Program

The selection of programs was based on the application of evaluation criteria and the ease of implementation in the City.

5.6.1 Alternatives Selected

The selected program to be implemented in the short-term planning period includes:

- Yard Waste drop-off program (Alternative 1, Option 4)
- Develop a windrow composting system (Alternative 2, Option 1)

In addition, the selected program to be implemented in the medium-term planning period includes:

- Establish a residential yard waste collection program (Alternative 1, Option 1)

This program was selected to recover a large portion of yard waste from the municipal waste stream in the short-term through a drop-off program and composting facility. A residential yard waste collection program will be developed in the medium-term planning period. The collection program will be implemented by the City's franchise hauler (SVRD); the regional drop-off sites and processing facility will also be implemented through an agreement of the participating jurisdictions with the operator of the San Martin transfer station (SVRD) and the Pacheco Pass landfill (SVRD).

The program meets the objectives of promoting diversion techniques that emphasize the separation of organic wastes from the municipal waste stream, establishing a yard waste drop-off program, evaluating the use of

alternative feedstocks in the composting process, and diverting yard waste from landfills through composting. Yard wastes will be collected from the drop-off sites and transported to the processing facility. After the yard waste and co-compost materials have been completely composted through the selected windrow system, the compost will be screened to produce a variety of marketable products.

5.6.2 Estimated Diversion Quantities

By developing a landfill salvage/drop-off program for yard wastes, and by processing these materials into compost, diversion through composting could account for approximately 3,318 tons or 10.6 percent of the waste stream. This diversion could be realized by the short-term planning period.

5.6.3 End Markets and End Uses

Agriculture will be targeted as the primary market for compost and mulch products. Although this is anticipated to be a reliable market, secondary markets will also be identified. Secondary markets consist of additional potential large-scale users and buyers of organic material in the region, including soil brokers, garden supply stores, nurseries, landscape contractors, sod growers, tree farms, and golf courses.

The City will implement appropriate procurement measures for composted materials. This "internal market" will be reliable and relatively stable during periods of fluctuation in other markets.

The strategy for marketing wood chips, resulting from the screening operations, will be dependent on the size and appearance of the product. If the wood chips are not marketable as a landscape dressing, they will be marketed as fuel. Although the diversion of wood chips for this purpose does not contribute to diversion credits under AB 939, and thus the diversion goals, revenue from the sale of wood chips, will help to defray the costs of the processing program. In addition, up to 10 percent transformation (as incineration is defined by AB 939) is allowable diversion credit under extreme circumstance in meeting the 50 percent diversion goal by 2000 (For further discussion of end uses, see Section 5.4.3.)

An additional end market that may be possible to develop is using compost as landfill cover at the Pacheco Pass landfill.

5.6.4 Materials Handling and Disposal Needs

A drop-off program will be utilized in conjunction with the development of a processing program. Disposal of additional contaminants from the screening process, including particles of glass, plastics, or metals, is anticipated to be minimal, but will be disposed of in the landfill. Aside from the screened contaminants, no special materials handling or disposal needs are anticipated.

5.6.5 Facility Needs

The following describes the required facilities to be implemented by the City's franchise hauler, SVRD. The program requires the purchase of shredding, turning, and screening equipment for implementation. Necessary equipment includes a loader, a mobile shredder (a "tub grinder" or other hammermill unit) mixer, compost turner, hoppers, conveyors, and a screen. Site preparation activities, such as grading for proper drainage, may also be required. Regular lab analyses of the finished product will increase the product's marketability. See Section 5.4.3 for further discussion of end uses.

Depending upon the number of jurisdictions that elect to cooperate in a regional yard waste processing operation, the scale of the facility would vary. For a yard waste processing program serving both the City of Gilroy and the City of Morgan Hill, approximately 7 acres of land would be required and a labor staff of about 3.

The cost of shredding equipment ranges from $50,000 to $400,000, depending on the type and capacity of the unit. Manufacturers of shredding equipment include Farmhand; Fuel Harvester; Jones Manufacturing; Iggesund Recycling, Inc.; Jacobsen, Inc.; Recycling Systems, Inc.; Shredding Systems, Inc.; Stumpmaster Inc.; and Universal Engineering.

Manufacturers of screening equipment include Heil Engineered Systems, Hobbs-Adams Engineering Co., Lindemann Recycling Equipment, Parker Manufacturing, Powerscreen of America, and Recycling Systems, Inc. The cost of screening equipment is approximately $125,000.

Manufacturers of mixing equipment include Brown Bear Corp.; JWI, Inc.; Koppers Co., Inc.; Littleford Bros., Inc.; McLanahan Corp.; Processall; Scat Engineering; and Sludge Systems, Inc. The cost of mixing equipment is approximately $50,000.

Manufacturers of turning equipment include Brown Bear Corp.; Eagle Crusher Co., Inc.; Kolman/Athey; Resource Recovery Systems of Nebraska, Inc.; Royer Industries; Scarab Manufacturing; Scat Engineering; and Wildcat Manufacturing Co., Inc. The cost of a compost turner can range from $100,000 to $200,000.

5.6.6 Measures to be Taken if Diversion Rate Requirements Cannot be Met

The City, or the City's franchise hauler and operator of the transfer station and landfill, will have several options in the event that the compost market is not viable for the diversion of organic materials. These alternatives include (1) stockpiling compost until the emergence of more favorable market conditions, (2) re-evaluating the use of additional alternative compost feedstocks to further improve compost quality and thus marketability, and (3) significantly increasing the quantities of compost utilized by the City to absorb compost stockpiles. While none of these options is currently recommended for implementation, they may be put into place as emergency measures to achieve the mandated diversion requirements.

5.7 Program Implementation

The following section describes the tasks necessary to implement the selected program.

5.7.1 Government Agencies Responsible for Implementation

The Community Development Department will be responsible for implementing, or developing and managing contracts for implementing the selected program.

5.7.2 Tasks Necessary to Implement Program

Yard waste drop-off and processing operations will be established by a City-contracted facility and, if possible, in cooperation with neighboring jurisdictions and SVRD. The local or regional processing program will be implemented in the short-term and medium-term planning period. The implementation of a marketing program for the improved compost product will continue into the medium-term planning period.

The program will include a pilot phase before full-scale program implementation. However, full-scale implementation will occur before 1995.

The compost marketing plan for the full-scale phase of the project will be based on market experience gained during the pilot phase.

Several steps will be required for implementation of the processing program in the short-term planning period. These will likely be completed by a City-contracted facility operator:

- determine compost product specifications
- develop compost process and facility design
- establish facility site
- obtain funding and necessary permits, including a Solid Waste Facilities Permit
- perform site improvements
- purchase and install processing and screening equipment
- start-up
- perform lab analyses
- test market compost products

The steps required for implementing the collection of alternative feedstocks in the medium-term planning period include:

- determine the compost feedstock specifications
- select the type and source of feedstock
- obtain funding
- establish collection routes or delivery frequency
- integrate alternative feedstock into composting process
- perform lab analyses
- test market co-compost products

5.7.3 Short-term and Medium-term Planning Period Implementation Schedule

The schedule in Table 5-2 presents the schedule for implementation of the selected program.

5.7.4 Implementation Costs

The total estimated annual cost for a composting program is $83,000 ($25 per ton) for the short-term planning period. These costs include the amortization of capital costs and assume no revenue from the sale of compost.

5.8 Monitoring and Evaluation

5.8.1 Methods to Quantify and Monitor Achievement of Objectives

To effectively monitor the achievement of the program in meeting the objectives, the following tasks should be undertaken:

- Record incoming yard waste quantities and participation rates from the City's curbside collection program and quantities delivered to drop-off sites.
- Compare and analyze disposal records from before and after the implementation of the selected program.
- Monitor market demand and trends
- If the above data is not conclusive, perform periodic updates to the waste generation study, as needed.

5.8.2 Written Criteria for Evaluating Program's Effectiveness

The City will evaluate the achievement of the selected composting program by the following criteria:

- Incoming yard waste will be monitored for increases in diversion quantities.
- Marketing strategies will be evaluated for effectiveness in moving compost products and whether additional markets or specifications are needed.

5.8.3 Agencies Responsible for Monitoring, Evaluation, and Reporting

The City of Morgan Hill Community Development Department will be responsible for the program's monitoring, evaluating, and reporting requirements.

5.8.4 Monitoring and Evaluation Funding Requirements

Additional staff time will be required to coordinate and monitor the composting program. The staff person assigned to this position can share their time with the monitoring of the recycling program and with public education in efforts. Funding of this staff position is included in the Funding Component, Section 9, Table 9-1. Direct monitoring costs for the composting program, exclusive of staffing, are estimated to be $3,000 per year.

5.8.5 Measures to be Implemented if There is a Shortfall in the Diversion Objectives

If the diversion objectives for composting are not met, or there is a shortfall in attaining the diversion mandate, the following measures may be implemented:

- See Section 5.5.6, Identification of Measures to be Taken if Requirement Cannot be Met, for alternatives in the event of a marketing shortfall.
- Increase the level of effort for public education
- Consider the inclusion of other alternative feedstocks from the wastestream into the compost process.
- Implement curbside collection of residential yard waste in the short-term planning period.

Table 5-1
SUMMARY OF ALTERNATIVES EVALUATION

Program Alternatives	Evaluation Critera					
	Effectiveness	Hazard	Ability to Accomodate Change	Consequences on the Waste Stream	Implementation Period	Facility Requirements
Alternative 1						
Residential Collection	High	High	Medium	High	High	Medium
Comm/Ind Program	Low	High	Medium	High	High	Medium
Alternative Feedstocks	Low	High	High	High	Medium	Medium
Drop-off Program	Medium	Medium	High	High	High	High
MSW Feedstock	High	Medium	Medium	High	High	Low
Yard Waste Ban	High	Medium	Low	High	Medium	Medium
Alternative 2						
Windrow Processing System	N/A	High	High	High	High	Low
In-vessel Processing System	N/A	High	High	High	Medium	Low

Program Alternatives	Additional Considerations			
	Consistency with Local Plans and Policies	Institutional Barriers	Estimated Cost	End Uses
Alternative 1				
Residential Collection	High	High	Medium	N/A
Comm/Ind Program	High	High	Medium	N/A
Alternative Feedstocks	High	Medium	High to Medium	N/A
Drop-off Program	High	High	High	N/A
MSW Feedstock	High	High	High	N/A
Yard Waste Ban	Low	Low	High	N/A
Alternative 2				
Windrow Processing System	High	High	Low	High
In-vessel Processing System	High	High	Low	High

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Table 5-2
Calendar of Composting Tasks

Program	Implementation Tasks	Date	Responsible Entity
Yard Waste Drop-Off Program and Window Composting Program	Contract for yard waste collection, processing and compost distribution services, obtain funding	Late-1993	Community Development Department
Yard Waste Collection Program	With contractor, determine collection method schedules and equipment needed	Mid-1996	Community Development Department
	Publicize program and, with contractor, start-up pilot collection program	Mid-1997	Community Development Department
	With contractor, expand to full program	Mid-1998	Community Development Department

6 SPECIAL WASTE COMPONENT

6.1 Introduction

Special wastes are solid wastes that require unique handling and disposal methods because of health hazards, environmental concerns, or physical characteristics. Special waste is defined in Section 18720, Article 3, Chapter 9, Title 14, California Code of Regulations (CCR). Special wastes require 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.

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 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 site's solid waste facility permit."

The special wastes addressed in this component are sewage sludge, ash, asbestos, abandoned vehicles, tires, dead animals, and white goods. The Solid Waste Generation Study identified that these waste types are generated in the City. Some of these special wastes have recycling potential, although markets and end uses may be limited. Special wastes that can be recovered count toward the AB 939 diversion targets of 25 percent by 1995 and 50 percent by 2000.

6.2 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 Morgan Hill. 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's objectives are:

- continue existing programs that divert recyclable special waste from landfilling, including programs for dead animals and white goods.
- continue to provide for environmentally safe management or disposal of special wastes that cannot be recycled. In the City of Morgan Hill, these wastes include asbestos.
- increase the recovery of recyclable special wastes from the disposal waste stream.
- reduce the hazard potential of special wastes

6.2.1 Targeted Materials

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

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. Presented below is a brief descrip-

tion of the targeted waste types and common handling requirements for the disposal of these 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. Sludges with heavy metals can require special disposal. Under present regulations, sewage sludge is not considered to be part of the municipal solid waste stream and is not eligible for diversion credits.

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] if specifically listed in the landfill's solid waste facility permit unless the Department of Toxic Substances Control (formerly Department of Health Services) determines that the waste must be managed at a hazardous waste facility. The primary sources of ash from the City include small quantities from fireplaces, burn-barrels, and accidental fires.

Currently no ash is being landfilled at the Pacheco Pass Landfill. However ash is included in the revised Solid Waste Facilities Permit application submitted by the landfill owner, South Valley Refuse 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.

Nonfriable (nonhazardous) asbestos can be disposed of at a Class III landfill, provided that certain handling requirements are adhered to and the

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1 A Class III landfill accepts only nonhazardous solid waste.

facility is properly permitted. Handling requirements include a dedicated disposal area away from the normal tipping area and prompt covering of the waste upon receipt; permitting requirements include waste discharge requirements permitting the disposal of asbestos.

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

Used tires pose special handling and disposal problems because of potential environmental and public health impacts. For example, stockpiled used tires can collect rainwater and serve as breeding grounds for disease vectors; they can also pose a fire hazard. Tires 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 avoid disposal problems. 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.

Abandoned vehicles (under California regulations), are considered to be an unclassified waste, thus qualifying for disposal in a Class III landfill. However, regulations implementing AB 939 exclude auto bodies from the waste stream. 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 animal collection and disposal is 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 rendering facility. 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.

"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.

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. SVRD is investigating installing Freon recovery equipment at the San Martin Transfer Station. Additionally, SVRD will take the necessary steps to comply with the requirements of AB 1790.

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

6.3 Existing Conditions Description

This section describes existing special waste diversion and management activities and programs in the City of Morgan Hill. The jurisdiction has carefully reviewed and documented all potential and ongoing special waste efforts, including all City programs. The quantities of special waste diverted by the City's programs (by waste category and waste type), are presented in Table 6-1. The existing special waste diversion rate, based on diverted quantities of white goods and dead animals, is estimated to be 1.5 percent of the current total waste stream. Sewage sludge is not included in this estimate because Morgan Hill does not generate sludge. The City's wastewater is treated at a treatment plant located in Gilroy.

The City of Morgan Hill has access to a variety of programs for managing special wastes, including asbestos, abandoned vehicles, used tires, dead animals, and white goods.

6.3.1 Asbestos

Non-friable asbestos is accepted at the Pacheco Pass Landfill. The landfill is operated by the City's franchised waste hauler. Friable asbestos must be manifested and taken to a hazardous waste disposal facility. The City does not maintain records on the amount of friable waste asbestos generated in the City.

6.3.2 Abandoned Vehicles

The Pacheco Pass landfill does not accept abandoned vehicles for disposal. Abandoned vehicles in the City are collected by local towing companies. The vehicles are either returned to their owners for a fee, auctioned off, or sent to dismantling yards where parts are removed and sold, and the scrap metal recovered for processing.

6.3.3 Used Tires

Used tires are currently disposed of at the Pacheco Pass landfill. At the disposal site, tires are temporarily stockpiled. The stockpiled tires are shredded periodically and the resulting waste landfilled. Shredding of the tires helps to alleviate potential health concerns created by rainwater collection and prevents landfill disposal problems.

6.3.4 Dead Animals

The disposal of small dead animals in the City of Morgan Hill is handled by the County of Santa Clara which has a contract for disposal with Koefran Services of Sacramento. Koefran provides a freezer at 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 facility within 48 hours of death.

6.3.5 White Goods

White goods in the disposal waste stream are removed from the waste stream at the San Martin Transfer Station. The materials are either sold for spare parts or are recycled for their scrap metal value.

6.3.6 Future Status of Programs

Of the special waste activities and programs identified above, the City of Morgan Hill anticipates that all of the programs will be continued during the short-term planning period. The only potential for increased diversion is to divert whole or shredded used tires from disposal in the landfill.

6.4 Evaluation of Alternatives

Management practices should take advantage of viable markets and end uses for recyclable special wastes. In the City of Morgan Hill, the recyclable special wastes currently disposed of include only used tires. With the exception of the first alternative, the waste management methods evaluated in this section address the objective of increasing the recovery of recyclable special waste from the waste stream.

The following special waste alternatives are evaluated below, based on the evaluation approach described in Appendix A. As presented in Section 18733.3 of Article 6.2 of Title 14, the evaluation criteria are as follows:

- effectiveness
- hazard
- ability to accommodate change
- consequences on the waste stream
- implementation period
- facility requirements
- consistency with local plans and policies
- institutional barriers
- estimated cost
- end uses

For each evaluation criterion, a rating of high, medium, or low is assigned, and the potential issues are discussed. As structured by the regulations governing AB 939, some of the criteria by which the alternatives are required to be evaluated are positive in tone (e.g., effectiveness), while others are inherently negative (e.g., hazard). A high rating for a positive criterion implies a positive rating; however, a high rating for a negative

criterion corresponds to few or no impacts associated with this potential problem. The rating results of the evaluation are summarized in Table 6-2, which is presented at the end of this section.

Alternative 1 - Disposal of Special Wastes.

Special wastes generated by the City of Morgan Hill can be disposed of at the Pacheco Pass landfill in accordance with the facility's permits. The landfill's permits allow for the disposal of all special wastes generated in the City excepting abandoned vehicles, and friable asbestos. 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 of Morgan Hill, as well as to compare it to other alternatives.

Effectiveness. Low. This alternative does not reduce quantities of special wastes currently disposed of.

Hazard. Medium. 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. High. With relatively minor changes in the management of special wastes, disposal of special wastes can be adjusted to conform with changing conditions.

Consequences to the Waste Stream. High. This alternative would not affect the waste stream.

Implementation Period. High. No "startup" period would be required.

Facility Requirements. High. This alternative would not require any new or expanded facilities.

Consistency with Local Conditions. High. Disposal of non-recyclable special wastes is consistent with local policies.

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

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

End Uses. Not applicable.

Alternative 2 - Divert Tires from Landfilling for Ultimate End Use

Used tires generated in the City of Morgan Hill 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. Currently, used tires are stockpiled at the Pacheco Pass landfill prior to shredding and disposal. Under this alternative, the City would encourage SVRD to develop a contractual arrangement with a firm such as Oxford Tire Recycling of Northern California to collect used tires generated in the City and stockpiled at the Pacheco Pass facility. 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. High. This alternative could be effective in reducing the quantity of used tires in the waste stream.

Hazard. Medium. 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. Medium. 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. High. This alternative would have a positive effect on the waste stream by diverting a problem waste from landfilling.

Implementation Period. Medium. 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. Low. 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 Section 42800, et seq., Public Resources Code.

Consistency with Local Plans and Policies. High. Diversion of tires for ultimate end use is consistent with policies of the City.

Institutional Barriers. Medium. Existing waste hauling and disposal contracts may be affected if used tires are diverted from the landfill for recycling.

Estimated Cost. Medium. Not available at this time.

End Uses. Medium. 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 fiber-glass 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 3 - Prohibit Disposal of Used Tires at Landfills

Used tires could continue to be accepted at the Pacheco Pass landfill and stockpiled, but would be banned from disposal. Instead of shredding and disposal, stockpiled tires could be recovered by a tire recycler, such as Oxford Tire Recycling of Northern California.

Effectiveness. High. This alternative would be effective in diverting tires from disposal, provided that transport, processing, and ultimate recycling can be arranged.

Hazard. Medium. 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. Medium. 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. High. This alternative would divert tires from the waste stream.

Implementation Period. High. The City could encourage SVRD to implement a landfill ban on tires in the short-term planning period.

Facility Requirements. High. No facilities are necessary for this alternative.

Consistency with Local Plans and Policies. High. This alternative is consistent with local conditions for stockpiling of tires.

Institutional Barriers. High. No known institutional barriers exist.

Estimated Cost. High. There are no significant costs associated with this alternative. Stockpiling of tires already takes place with current landfill staff.

End Uses. Medium. 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.

6.5 Selection of Program

In the previous section, three 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 described 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 alterna-

tives. 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. The results of these ratings are presented in Table 6-2.

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

6.5.1 Short-Term Planning Period

The City of Morgan Hill has selected the following alternative:

- Work with neighboring jurisdictions to encourage SVRD to prohibit disposal of used tires at the landfill

This selection is based on impact and effectiveness, as well as ease of implementation in the short-term.

6.5.2 Short-Term and Medium-Term Planning Periods

All existing programs and alternatives selected in the short-term planning period will be continued in the medium-term.

6.5.3 Quantities and Types of Wastes Anticipated to be Diverted

Based on the solid waste disposal study conducted for the City, approximately 159 tons of used tires currently disposed of could be diverted. This quantity represents 0.5 percent of the wastestream.

6.5.4 Applicable End Uses

Tires that are not reused or used for casings can be used for their energy value. A large tire-to-energy facility is located in the Central Valley of California. At this facility, whole tires are incinerated to produce steam to generate electricity. The facility recovers incineration by-products that include fly ash and gypsum. The fly ash containing zinc is shipped to a smelting facility. Gypsum has nonagricultural land applications. Slag from

steel and fiberglass belts in the tires is recovered and used for road base. The slag is 95 percent ferrous.

6.5.5 Handling and Disposal Methods

Used tires will be stockpiled and collected by a recycler.

6.5.6 Facilities to be Utilized for Implementation

Tires can continue to be stockpiled at the Pacheco Pass landfill.

6.6 Program Implementation

This section identifies and describes the specific government agencies responsible for implementing the selected alternatives and programs; the specific tasks necessary to implement the selected alternative; an implementation schedule; and implementation costs. This information is presented in Table 6-3.

6.6.1 Organizations Responsible for Implementation

The City of Morgan Hill Community Development Department will be responsible for working with neighboring jurisdictions to coordinate the development of the tire diversion program by SVRD.

6.6.2 Tasks Necessary to Implement Program

Implementation tasks are shown in Table 6-3.

6.6.3 Short-term and Medium-term Planning Period Implementation Schedule

The implementation of the selected program would take place in the short-term planning period.

6.6.4 Implementation Costs

No additional costs are anticipated to maintain this program.

6.6.5 Multi-Jurisdictional Special Waste Efforts

Multi-jurisdictional efforts will be needed to implement the selected alternative, since tires received at the landfill are not exclusively from Morgan

Hill. The Pacheco Pass landfill receives wastes from Gilroy and from Santa Clara County.

6.7 Monitoring and Evaluation

To ensure that the selected special waste alternative is meeting the 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.

6.7.1 Methods to Quantity and Monitor Achievement of Objectives

This section presents the methods for quantifying and monitoring the achievement of the following objectives for the special waste component.

Objective 3: Increase the recovery of recyclable special waste from the solid waste stream.

Monitoring Method: Periodic inspections of handling methods for special wastes will be conducted at the Pacheco Pass 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 wastes that pose health and safety hazards.

6.7.2 Criteria for Evaluating Program Effectiveness

The City will prepare annual reports summarizing the findings of the monitoring activities described above. The report will provide 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.

6.7.3 Responsible Parties for Monitoring, Evaluation, and Reporting

The monitoring, evaluation, and reporting activities described in this section will be implemented by the City of Morgan Hill Community Development Department.

6.7.4 Monitoring and Evaluation Funding Requirements

Funding for the monitoring and evaluation program described in this section will be provided by the City. 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. These monitoring costs will be absorbed by the monitoring programs planned for the recycling and composting programs. No additional monitoring costs for the special waste program are anticipated.

6.7.5 Contingency Measures

If the program described above fails to meet the objectives of this component, the following tasks can be implemented:

- Introduce additional waste acceptance procedures at the landfill in order to divert tires 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.
- 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
- Consider regulatory programs or mandatory programs

Table 6-1
SUMMARY OF EXISTING SPECIAL WASTES CONDITIONS
City of Morgan Hill

SPECIAL WASTE TYPE	ACCEPTED AT PACHECO PASS LANDFILL/SAN MARTIN TRANSFER STATION	HANDLING PRACTICE	ESTIMATED ANNUAL TONS GENERATED	ESTIMATED ANNUAL TONS DIVERTED	END USE/ MARKETS
ASBESTOS	Yes/No	Friable asbestos manifested and hauled by licensed hauler Nonfriable asbestos disposed of at the landfill	unknown	0	Landfill
ABANDONED VEHICLES	No/No	Collected by towing company	NA*	NA	Scrap metal
DEAD ANIMALS	No/No	Collected at Santa Clara County Animal Shelter	NA	NA	Bone meal and fertilizer
TIRES	Yes/Yes	Stopckpiled at landfill stie prior to shedding and landfilling	196	6	Re-use, tire derived products, energy
WHITE GOODS	Yes/Yes	Removed from waste stream at transfer station and landfill	580	467	Scrap metal
* Not Available					

Table 6-2
SUMMARY OF ALTERNATIVES EVALUATION

Program Alternatives	Evaluation Criteria					
	Effectiveness	Hazard	Ability to Accomodate Change	Consequences on the Waste Stream	Implementation Period	Facility Requirements
Alternative 1 Disposal of Special Wastes	Low	Medium	High	High	High	High
Alternative 2 Divert Tires From Landfill	High	Medium	Medium	High	Medium	Low
Alternative 3 Prohibit Disposal of Tires	High	Medium	Medium	High	High	High

Program Alternatives	Additional Considerations			
	Consistency with Local Plans and Policies	Institutional Barriers	Estimated Cost	End Uses
Alternative 1 Disposal of Special Wastes	High	High	High	NA
Alternative 2 Divert Tires From Landfill	High	Medium	Medium	Medium
Alternative 3 Prohibit Disposal of Tires	High	High	High	Medium

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Table 6-3
Calendar of Special Waste Tasks

Targeted Generator	Type of Program	Implementation Tasks	Date
Commercial	Ban tires from disposal at the landfill	Coordinate with South Valley Refuse Disposal, Inc. to locate a waste tire recycler; coordinate with hauler to negotiate and ratify agreement with waste tire recycler	Early-1993

7 EDUCATION AND PUBLIC INFORMATION COMPONENT

7.1 Introduction

Education and public information are separate mechanisms that work together towards a common goal. Education is an ongoing activity that explains, through knowledge and awareness, why waste reduction programs are necessary. Public information is a method of letting the public know how to effectively participate in programs. Both ongoing education and public information are essential to the successful implementation of the SRRE. The education and public information component is thus the mechanism that facilitates the success of all the other components.

A community could fall short of the mandated waste diversion goals if it merely selects programs without providing methods of informing and educating the people who generate the waste. Changing the behavior of the community as a whole is critical to the success of these programs. In order to reach state-mandated waste reduction goals of 25 and 50 percent, the City must reach all sectors of its population with public information activities in the community.

Through education and public information, the City of Morgan Hill can encourage citizens to develop "waste reduction" behavior. Drawing upon a sense of community and a desire to create a viable environment for future generations, Morgan Hill can have successful participation in waste reduction programs without using mandatory actions. Education and public information about the solid waste issue will play significant roles in the success of Morgan Hill 's waste reduction programs.

This component presents education and public information objectives and identifies existing and proposed education and public information activities for achieving those objectives.

7.2 Objectives

The City of Morgan Hill developed education and public information objectives to meet the needs of the selected waste diversion programs. The following objectives are to be implemented in the short-term planning period (1991-1995) and continue during the medium-term planning period (1996-2000).

- Heighten public awareness of solid waste reduction issues on an ongoing basis, especially of the need to reduce, reuse, compost, and recycle waste
- Monitor the development and integration of educational programs on reduction, recycling, and resource conservation into the curricula of schools in the City
- Provide public recognition of private and public groups, associations, businesses, or individuals that support, participate in, or implement waste reduction programs
- Promote and provide technical assistance on backyard composting as a source reduction effort
- Provide public information on programs for recyclables, yard waste, and special wastes

7.3 Existing Conditions Description

The City has not sponsored education or public information programs related to solid waste management. However, the City has recently received a recycling outreach grant from the Department of Conservation (DOC Grant Number 5090-126) for approximately $12,000. The City will use the grant to fund public education activities that promote the City's planned waste reduction and recycling program. Should the City decide not to implement a curbside recycling program, the grant will be used to educate residents on alternative programs selected. The types of public education programs selected by the City are described in Section 7.5.

7.4 Targeted Audience for Selected Programs

After reviewing waste characterization data from the solid waste generation study, the City proposes to target the following solid waste generators as recipients of the City's education and public information programs.

- **Residential Customers.** Residential waste generators account for approximately 26 percent of the generated waste stream. Residential generators will be targeted for education about source reduction, recycling, and composting programs.
- **Commercial Customers.** Commercial waste generators account for approximately 23 percent of the generated waste stream. These customers will be targeted for eduction about source reduction, recycling, and composting programs.
- **Self-Haulers.** The City has a significant number of self haulers, representing 22 percent of the City's generated waste stream. Self-haulers will be targeted for education about proposed recycling and composting programs at the San Martin Transfer Station.
- **Institutions.** Although the Solid Waste Characterization Study did not target institutions (e.g., schools and government agencies), these waste generators offer special challenges and opportunities for education and public information programs. Schools and other public agencies can serve as models.
- **Non-English Speaking Generators.** The City has a significant proportion of Hispanic residents. Based on information obtained from Morgan Hill's community economic profile (June 1991), approximately 23.4 percent of residents in Morgan Hill are Hispanic. While not all of these residents will require specialized public education and outreach materials, some will require specialized effort on the part of the City to increase their participation and overall awareness of the programs available to them.

7.5 Selection of Programs

The following programs were selected to educate and inform the public about the selected recycling, source reduction, and composting programs. South Valley Refuse Disposal and other independent recyclers will likely play a significant role in the development and implementation of these programs.

7.5.1 Information

Newspaper Advertisements. Because of the broad geographic areas they serve, newspapers provide a very visible means of communication for announcing new recycling programs and events in the community.

News Releases. News releases for local newspapers, including the *Morgan Hill Times*, the *Gilroy Dispatch* and the *San Jose Mercury News* will be prepared to kick off new recycling programs. These news releases are sometimes run "as is" in printed media, or serve as a catalyst, in print or broadcast, for a more detailed feature piece.

Public Service Announcements. Radio and television are effective media for educating the community on new recycling and composting programs. Virtually every Bay Area radio and television station offers free air time to non-profit organizations to announce an event. The City will take advantage of this by working with non-profit organizations to sponsor public service announcements (PSAs).

Videos. Various videos can be purchased that provide information on source reduction, recycling, composting, and other solid waste issues. The City will present "how to" recycling videos on Channel 34, the City's cable television station. These videos can also be presented to the general public through the local library, at workshops, schools, churches, and local events.

Utility Bill Inserts. Any type of ongoing mailer for which the City is currently responsible (e.g. property tax bills) will be considered an opportunity for an informational/educational insert. This can be an effective communication tool. The insert can be a simple, one-page flyer providing recycling information or announcing upcoming recycling events in the community. Adding an insert to an existing bill, for instance, is also cost-effective (assuming the insert weighs very little), as it allows the mailing of more information for the same total postage cost.

Newsletter. The City will prepare articles on the various waste reduction programs available for publication in the City's newsletter that is distributed to all residents.

7.5.2 Outreach

Volunteer Training Program. The City will utilize the volunteer services of non-profit organizations and recycling advocates for community out-

reach. The City will develop a volunteer training packet and recruit and train volunteers to serve as neighborhood recycling advocates. Organizations, such as youth groups, auxiliary groups, senior citizens groups, and churches can provide excellent networking and public education opportunities on recycling programs in the community. For example, a public education program on recycling, source reduction, and composting could be integrated into the Eagle Scout community service project for the Boy Scouts of America.

Public Presentations Public presentations on solid waste issues will be conducted to community groups, businesses, government agencies, and schools. This provides an excellent opportunity to describe the waste reduction programs available to the community and disseminate educational and promotional materials. A slide show presentation will be developed for use at public presentations. The City will organize a speakers bureau that includes volunteer speakers on solid waste issues. The list of speakers will be distributed to community groups, schools, businesses, government offices, and churches interested in sponsoring a workshop or seminar on waste management.

Participation in Local Events. Participating in local events is a highly visible method of reaching the community about waste reduction programs. The City will develop a portable display on recycling and waste reduction issues that will be exhibited at local events such as the Mushroom Mardi Gras, or July 4th parade. The City can also provide recycling programs at parks and events held locally, such as craft shows, festivals, and ball games.

7.5.3 Technical Assistance

Junk Mail Reduction Program. Information is available from the Direct Mail Marketing Association of America and other such groups regarding the large volume of junk mail each household receives each year, and what can be done to minimize it. In other communities, this information is being disseminated and interest is ongoing.

How-To-Brochures. Brochures will be mailed or distributed to residents and businesses to announce new recycling programs or events. Materials will include information on where and how to recycle, compost, and source reduce. The City will also include information on special wastes, household hazardous waste, and other materials that require special handling.

Information brochures and fact sheets can encourage participation in proposed programs. This is a particularly good way to kick off a new program, such as curbside recycling or a widespread commercial recycling program.

Technical Assistance. Businesses and industries may require assistance in setting up collection programs, implementing source reduction programs, and buying recycled products.

Backyard Composting and Xeriscaping. Workshops and brochures related to backyard composting and xeriscaping can address practical ways to reduce the quantity of yard wastes generated.

7.5.4 Public Awareness

Environmental Shopping Campaign. The City can distribute a "Buy Recycled" pamphlet to urge residents to "complete the loop" by buying recycled products whenever possible. The City will also consider distributing a source reduction shopping checklist for consumers. The checklist would focus on criteria consumers can use when buying products, including durability, reusability, recyclability, and minimal packaging.

Contests and Displays. The City can sponsor and promote a "No Garbage Lunch Day," poster contests, school contests, and library displays that would target businesses, government, schools, and residents.

Promotional Materials. The City will distribute waste reduction promotional materials targeted at all age groups. Effective materials available from the State Department of Conservation and other sources include door hangers, bookcovers, posters, bookmarks, stickers, yoyo's, recycled paper notepads, certificates, recycled plastic Frisbees, buttons, pencils, and magnets. These materials can be incorporated into many of the other public information and education activities described. The Department of Conservation has developed promotional materials that are available at no cost.

Model waste reduction program. The City will coordinate field trips each year for students to see the best waste reduction operations occurring locally. Students can see first hand how a business recycling program operates or how material is processed at the San Martin Transfer Station. A slide show presentation of local or regional model waste reduction programs will be used with public presentations and workshops. This pro-

gram will encourage others to incorporate the same type of behavior into daily activities.

Public Recognition and Awards. Public recognition and awards will be used by the City to acknowledge businesses that have implemented source reduction and recycling activities. The recipients of the awards can also be schools, community groups, and individuals who are promoting source reduction, composting, and recycling in the community. Awards will strengthen the public's awareness of the need to reduce waste.

7.5.5 Education

Environmental Education Curriculum. The City will work to incorporate a solid waste curriculum for all grade levels into the schools. Solid waste curricula (many of them free) are available for all ages from several sources. For example, the EPA publishes free educational materials about solid waste generation and management for grades kindergarten through twelfth.

7.6 Program Implementation

The following section presents the responsible parties, implementation schedule and tasks for selected education and public information programs.

7.6.1 Government Agencies Responsible for Implementation

The City of Morgan Hill Community Development Department will be responsible for implementing education and public information activities.

The City will likely coordinate public education efforts with South Valley Refuse Disposal since the hauler will be involved in the implementation and operation of many of the recycling and composting programs selected in the SRRE. The City will also coordinate efforts with independent recyclers regarding the types of services available and materials accepted. The City will also coordinate its efforts with the City of Gilroy and with Santa Clara County.

7.6.2 Tasks Necessary to Implement Activities

Before Morgan Hill can expand its public education program, additional staffing is needed. The City will hire additional staffing to oversee waste

management operations in the City, in addition to the public education programs. The City will also rely on interns to promote selected public education programs.

The tasks necessary to implement the education and public information activities are summarized in Tables 7-1. The implementation tasks are presented for source reduction, recycling, and composting by selected waste reduction programs.

7.6.3 Implementation Schedule

The implementation schedule for the education and public information activities is also presented in Tables 7-1. The implementation schedule for public education and information is presented by each component's selected waste reduction programs.

7.6.4 Implementation Costs

The funding requirements for the education and public information programs selected in this component consist of direct costs for materials, supplies, and promotional items.

Direct costs for materials will vary extensively depending upon the level of program activity. It is estimated that a program budget of approximately $30,000 per year would allow some degree of coverage across each of the selected activities in this component, including: brochures; informational flyers and pamphlets; mail inserts; and promotional materials. The DOC grant will cover approximately one third of these expenses for the first year.

7.7 Monitoring and Evaluation

7.7.1 Methods to Quantify and Monitor Achievement of Objectives

The objectives of Morgan Hill's education and public information program are to increase the public's participation in waste diversion programs and to heighten awareness of the need to reduce, reuse, compost, and recycle. To monitor the achievement of these objectives, residents will be randomly surveyed by telephone, at major shopping centers in the City, or both. The random survey will focus on the public's awareness of various waste diversion programs available in the City. The survey will also assist

in identifying the relative effectiveness of alternative education and public information techniques.

The number of businesses requesting assistance will also be tracked to determine if the participation rate in each respective program has increased. Monitoring can also take the form of mail-in response coupons in newspaper ads, surveys of events, periodic surveys, and telephone calls. Measurement tools will be an integrated component of public information and education activities, whenever possible.

7.7.2 Written Criteria for Evaluating the Program's Effectiveness

The City will evaluate the effectiveness of the education and public information program by addressing the following issues:

- Have the participation rates in respective waste diversion programs increased?
- Has the City received more inquiries about the waste diversion programs available?
- Was there sufficient City staffing to implement the education and public information programs?
- Do the targeted generators have a greater awareness of the importance of diverting wastes from land disposal?
- Was each segment of the community (e.g., residential, non-english speaking, commercial, industrial, schools) contacted during the planning period?

7.7.3 Agencies, Organization, Persons (or a Combination) Responsible for the Program's Monitoring, Evaluation, and Reporting

The City of Morgan Hill's Community Development Department is responsible for monitoring and evaluating the effectiveness of the education and public information programs.

7.7.4 Monitoring and Evaluation Funding Requirements

Funding is needed for staffing and support services to monitor the effectiveness of the education and public information programs implemented in Morgan Hill. Specifically, funding is needed for recordkeeping and sur-

veying the participation rates of respective waste reduction programs. These costs are estimated to be $4,000 per year (see Table 9-1).

7.7.5 Contingency Measures

The following measures will be implemented if the education and information objectives identified in Section 8.2 are not achieved:

- evaluate the need for increased staffing, including a contract employee, additional interns, or part-time/full-time permanent staffing
- revise the job descriptions of staff responsible for education and information
- evaluate the need for increased funding for education and information programs
- modify the education and public information programs that seem to be inadequate
- identify additional education and public information programs for consideration

7.7.6 Monitoring and Reporting Schedule

The City of Morgan Hill will evaluate the timeline for implementing education and public information programs to determine if programs are implementable on schedule. The following items will be addressed:

- time modifications needed to increase staffing levels
- time modifications needed to coordinate with volunteer organizations and other jurisdictions for specific programs
- time modifications needed to secure City approval for funding and operation of selected programs

Table 7-1
Calendar of Education and Public Information Tasks

Program	Implementation Tasks	Start Date	Responsible Agency
Education	Prepare articles on various waste reduction programs for City newsletter; distribute source reduction checklist; and distribute buy-recycled pamphlet to residents	Mid-1992	Community Development Department
Outreach	Implement waste reduction measures at local events; coordinate efforts with community groups	Mid-1992	Community Development Department
Technical Assistance	Publicize and disseminate information on reducing unwanted junk mail	Mid-1992	Community Development Department
Technical Assistance	Mail brochures to residents and businesses announcing new recycling programs; develop a volunteer training packet; solicit for volunteers; and train neighborhood recycling advocates	Mid-1992	Community Development Department
Public Presentations and Workshops	Conduct Workshop; develop speakers bureau; provide technical assistance to businesses	Early-1993	Community Development Department
Environmental Education Curriculum	Establish an integrated waste management curriculum for schools	Early-1993	Community Development Department

Table 7-1
Calendar of Education and Public Information Tasks
(Continued)

Program	Implementation Tasks	Start Date	Responsible Agency
Education	Conduct field trips of waste management facilities and model recycling programs	Early-1993	Community Development Department
On-site Composting and Xeriscaping	Encourage on-site composting, xeriscaping, and mulching of green wastes	Late-1993	Community Development Department
Information	Disseminate information on recycling and composting programs via utility bill inserts, news releases, public service announcements and newspaper advertisements; distribute recycling videos through library system	Late-1993	Community Development Department
Public Awareness	Disseminate promotional materials; establish contests and displays develop a composting exhibit	Late-1993	Community Development Department
Public Recognition and Awards	Establish and publicize public recognition and awards program	Early-1994	Community Development Department

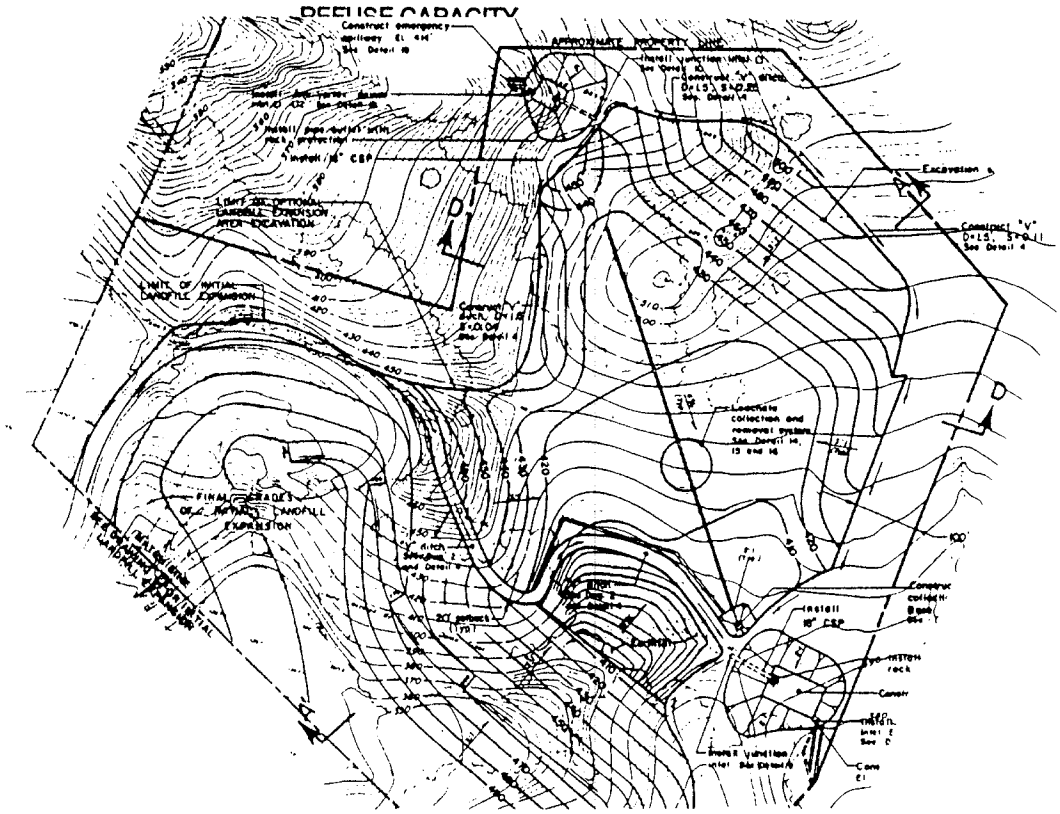
LANDFILL SPECIFICATIONS AND DESIGN PARAMETERS

SIZE

LANDFILL AREA		185 ACRES
ENTRANCE FACILITIES		15 ACRES
PERIMETER BUFFER		30 ACRES
RIVER AREA		90 ACRES
	TOTAL PROPERTY AREA	320 ACRES

CAPACITY

ABOVE GROUND AIRSPACE		11,125,000 CY
QUARRY MATERIAL		10,557,000 CY
	TOTAL AIRSPACE	21,682,000 CY
REFUSE CAPACITY		21,882,000 CY
REFUSE CAPACITY		13,129,000 TONS



	46 YEARS
	31 YEARS
	23 YEARS
	26 YEARS
	20 YEARS
	16 YEARS
	5,470,000 CY
	896,000 CY
	1,493,000 CY
	200,000 CY
	3,000,000 CY
	5,059,000 CY
	63 FEET
	32 FEET

DISPOSAL CAPACITY

8 DISPOSAL FACILITY CAPACITY COMPONENT

Integrated waste management includes the environmentally safe disposal of solid wastes that cannot be feasibly diverted from landfilling. Because of the diminishing landfill capacity in the state of California, the Integrated Waste Management Act of 1989 requires that, in their Source Reduction and Recycling Elements, jurisdictions identify their current and future solid waste disposal capacity needs.

This component contains a description of any permitted solid waste disposal facilities within the City of Morgan Hill, an identification of the needed landfill capacity for 15 years, an identification of any disposal facility within Morgan Hill that will be closed during the next 10 years, and an identification of any plans to establish new or expanded disposal facilities within the jurisdiction during the next 10 years.

8.1 Existing Permitted Solid Waste Disposal Facilities

There are no existing permitted solid waste disposal facilities within the incorporated limits of the City of Morgan Hill. The City currently exports all of its solid waste for disposal to the Pacheco Pass Sanitary Landfill located in the County of Santa Clara. The Pacheco Pass Sanitary Landfill is owned by South Valley Refuse Disposal, Inc., the City's franchised waste hauler. Provisions for disposal at the Pacheco Pass landfill are included in the franchise agreement, presented in Appendix 4.

The Pacheco Pass Landfill is owned by Gilroy Garbage Company and South Valley Refuse Disposal Company, Inc., and operated by South Valley Refuse. The facility generally accepts franchised residential and commercial wastes from the cities of Gilroy and Morgan Hill, and adjacent unincorporated areas. The site's tipping fee is $24.00 per ton.

The 97-acre landfill is located on a hillside east of Gilroy, off of Pacheco Pass Highway and Bloomfield Road. The property, zoned for agriculture,

is surrounded by rural agricultural land uses. Site access is provided by a 4,000 foot paved road originating at the Pacheco Pass Highway.

The Class III landfill accepts garbage, rubbish, cannery wastes (dry), street refuse, brush, stumps, and demolition wastes for disposal. No hazardous or designated wastes may be accepted. According to site records, the facility landfilled 74,400 tons (121,000 cubic yards) of waste between July 1991 and June 1992. The landfill currently charges $24.00 per ton to dispose of wastes.

In early 1985, a 60-acre expansion into Parcel III of the site received final approval from the CWMB. During site development, an earthquake fault was discovered and reported to the Central Coast Regional Water Quality Control Board by the site owner. In response to this discovery, 20 acres of the 60-acre expansion site were redesigned to include a double liner, and are currently being developed for future disposal use. Until the remaining 40 acres receives Waste Discharge Requirements, South Valley Refuse plans to utilize the acreage for recycling activities and disposal of inert materials. The company anticipates that this will help to extend the life of the fully-permitted 20 acres. With limited expansion into Parcel III, the remaining refuse capacity of the landfill (as of October 1992) is 1.3 million cubic yards (800,000 tons) and the projected closure date is September 2000. After closure, the site is proposed for agricultural uses.[1]

8.2 Solid Waste Disposal Facility Needs Projection

The needs projection for a solid waste disposal facility provides an estimate of the disposal capacity that is needed in order to accommodate projected solid waste generation within the City for a 15-year period commencing in 1991. The projected solid waste generation for this 15-year period is discussed in Section 2, the Solid Waste Generation Analysis, and in Appendix 2, the Solid Waste Disposal Characterization.

The capacity required for disposal of solid waste generated within the City, and for waste imported to the City, was calculated using the following equation developed by the CIWMB:

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1 Source: *Report of Disposal Site Information, Pacheco Pass Landfill*, EMCON Associates, 1992.

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

where

G = The amount of solid waste projected to be generated in Morgan Hill.

The amount of solid waste generated in Morgan Hill in 1990 was approximately 31,044 tons. Accounting for projections of population growth, the estimated annual waste generation rates for the City were calculated.

I = The amount of solid waste that is expected to be imported to Morgan Hill for disposal.

There is no solid waste imported into Morgan Hill for disposal.

D = The amount of solid waste diverted through current source reduction, recycling, and composting programs.

The amount of solid waste diverted from disposal through existing source reduction, recycling, and composting programs in 1990 was approximately 2,148 tons.

TC = The amount of volume reduction occurring though permitted transformation facilities.

Approximately 498 tons of solid waste generated in Morgan Hill was transformed in 1990.

LF = The amount of permitted solid waste disposal capacity that is available in Morgan Hill for solid waste generated within the City.

There are no permitted solid waste disposal facilities in the City.

E = The amount of solid waste generated in the City that is exported to solid waste disposal facilities in another jurisdiction.

Approximately 28,398 tons of solid wastes generated in the City in 1990 were exported to a solid waste disposal facility in the County of Santa Clara.

n = Each year of a 15-year period commencing in 1991.

Results of the solid waste disposal facility needs projection are shown in Tables 8-1 and 8-2. With an estimated closure date of September 2000, the Pacheco Pass Landfill will likely be unable to meet the solid waste

disposal capacity needs of Morgan Hill. The City's franchise agreement with SVRD extends to January of 2008. SVRD will be responsible for locating sufficient disposal capacity to handle the City's waste stream through the end of its franchise agreement.

8.3 Disposal Facility Phase-Out or Closure

As noted in Section 8.1, the City has a disposal agreement with South Valley Refuse Disposal which will expire in 2008. In order to secure the required additional capacity for each year after 2002 (when the Pacheco Pass Landfill is estimated to reach capacity) the City will work with SVRD to secure access to additional disposal facilities or enter into a new disposal agreement with a different operator.

8.4 New or Expanded Disposal Facility

There are currently no plans to establish a new disposal facility in Morgan Hill during the short- or medium-term planning periods.

Table 8-1

City of Morgan Hill
Solid Waste Disposal Facility Capacity Needs Projection
Under Existing Conditions

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Solid Waste Generated	31,820	32,616	33,431	34,267	35,123	36,002	36,902	37,824	38,770	39,739	40,732	41,751	42,794	43,864	44,961
Solid Waste Imported	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solid Waste Diverted*	2,196	2,250	2,307	2,364	2,424	2,484	2,546	2,610	2,675	2,742	2,811	2,881	2,953	3,027	3,102
Transformation Reduction	509	522	535	548	562	576	590	605	620	636	652	668	685	702	719
Solid Waste Exported**	29,115	29,843	30,589	31,354	32,138	32,941	33,765	34,609	35,474	36,361	37,270	38,202	39,157	40,136	41,139
Remaining Permitted Disposal Capacity (end of year)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Additional Disposal Capacity Needed (cubic yards)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

* Based on compliance with the diversion requirements of AB 939.
** Refers to solid waste exported out of the City to be disposed of.

Table 8-2

City of Morgan Hill
Solid Waste Disposal Facility Capacity Needs Projection
Considering AB 939 Diversion Requirements

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Solid Waste Generated	31,820	32,616	33,431	34,267	35,123	36,002	36,902	37,824	38,770	39,739	40,732	41,751	42,794	43,864	44,961
Solid Waste Imported	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solid Waste Diverted*	2,196	3,262	5,015	6,853	8,781	10,800	12,916	15,130	17,446	19,869	20,366	20,875	21,397	21,932	22,480
Transformation Reduction	509	522	535	548	562	576	590	605	620	636	652	668	685	702	719
Solid Waste Exported**	29,115	28,832	27,881	26,865	25,781	24,625	23,396	22,089	20,703	19,234	19,714	20,207	20,713	21,230	21,761
Remaining Permitted Disposal Capacity (end of year)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Additional Disposal Capacity Needed (cubic yards)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

* Based on compliance with the diversion requirements of AB 939.
** Refers to solid waste exported out of the City to be disposed of.

9 FUNDING COMPONENT

The purpose of the funding component is to demonstrate that the City of Morgan Hill has sufficient funds and allocation of resources to plan, develop, and implement the selected SRRE programs identified in this document.

This section briefly describes (1) the current mechanisms used to fund solid waste programs for the City of Morgan Hill, (2) estimated costs for the component programs scheduled for implementation in the short-term planning period, (3) additional staff resources required to implement the programs, (4) revenue sources to support the component programs, and (5) contingency funding sources.

Adequate and long-term funding is an essential component of a successful integrated solid waste management system. Inadequate funding can cause an otherwise effective program to fail. In California, local solid waste management systems are typically funded by one or more of the following methods:

- *Tipping fee* - the amount charged by a transfer station, landfill, or transformation facility to accept a specified amount of waste (usually expressed in terms of tons or cubic yards).
- *Property taxes* - those taxes that are levied on the person or corporation recorded on the deed of record. Property taxes have limitations such as (1) statutory ceilings on tax rates, (2) competing public services such as public education, (3) lack of income or economic activity to support higher taxes, and (4) lack of voter support.
- *User fees* - fees applied to the collection and disposal of residential, commercial, and industrial waste and to the disposal of self-haul waste. User fees assess the waste generator based on weight, volume, or number of con-

tainers collected, instead of an assessment based on a flat fee or on revenues generated by local tax and financing systems.

9.1 Current Funding Sources

The City's municipal code provides that rates for refuse collection shall be established by City Council resolution. The City has a twenty-year (1988-2008) collection agreement with South Valley Refuse Disposal for the right to collect solid waste generated by the residential, commercial, and industrial sectors. This same agreement also provides for the disposal of this waste.

The City's rate structure combines all fees for solid waste-related services, including refuse collection and disposal, the current and planned residential, commercial, and industrial recycling and composting services, the public education program, and the household hazardous waste collection and disposal program. The City bills all customers and routes all revenues received, minus the City's 16.5 percent franchise fee to SVRD. The franchise fee is deposited in the City's refuse enterprise fund. A 6.5 percent of the franchise fee is dedicated to the development, implementation and administration of the City's AB 939 program.

An additional source of funding available to the City is a surcharge authorized by AB 939 and collected on the tipping fee at the landfill. Through an apportionment schedule, a portion of the collected funds can be distributed to the enterprise funds of the various cities in the County.

9.2 Estimated Program Costs

Estimated costs have been determined for each of the new or expanded programs that have been identified in Sections 3 through 7 for implementation during the short-term planning period. Table 9-1 shows the estimated costs for (1) planning/program development, (2) implementation (capital and operating costs), and (3) monitoring for each of these programs, by year, for 1991 through 1995. Capital costs include equipment purchases and new or improved structures. Operating costs include operations and maintenance, publications and other promotional materials, City staff time, and other expenses. The implementation cost is an estimate of the annual cost to supply the service assuming amortization of capital costs.

One additional staff position, an environmental programs assistant, will be added to the City's Community Development Department staff in 1992. This new staff position, along with existing staff, will be responsible for planning, developing, implementing, and monitoring the programs identified in this document (Sections 3 through 7). The environmental programs assistant will work on duties associated with the various recycling program elements and will also coordinate the composting program and public education efforts. Volunteers or interns will be utilized for tasks such as conducting surveys required for program monitoring, evaluation, and reporting. Costs for the additional staff position are listed separately in Table 9-1.

9.3 Revenue Source for New and Expanded Programs

The source of funding to implement the short-term programs identified in Sections 3 through 7 of this document will be the Refuse Enterprise Fund. It is anticipated that the Fund's current revenue sources will be inadequate to cover the cost of these short-term programs. However, the City intends to make adjustments to its existing refuse rate structure to fund the implementation of the provisions of AB 939. The rate adjustments will be phased in during the short-term planning period beginning in 1992.

9.4 Contingency Funding Sources

Funding sources and mechanisms that could be explored by the City if a shortfall in solid waste management funds occurs are as follows:

- Special taxes or assessment. The City could impose short-term taxes or assessments to develop source reduction and recycling programs.
- Rate structure modification. This includes a subscribed variable rate wherein the level of payment varies with a measure of the volume of waste disposed.
- Community Development Block Grants. The City could apply for the Economic Development Allocation for the Community Development Block Grant Program. Grants are made from the State to local government applicants, which can then loan the funds to businesses to fund specific projects, such as a particular recycling program or

business that uses or manufactures products made from recyclable materials.

- Other grant funding sources. These include grants from the California Integrated Waste Management Board for new or existing household hazardous waste management programs or from the California Department of Commerce Office of Competitive Technology to fund technological projects that show promise for commercialization. In 1989, federal, public and private agencies and institutions were awarded 29 grants from a pool of over 240 applicants.

Table 9-1
Funds Required for Planning, Implementation, and Monitoring of Programs
to be Implemented in the Short-Term Planning Period[1]

	1992	1993	1994	1995
Source Reduction - Public Education and Technical Assistance				
Planning/Program Development				
Implementation (Capital, Operations & Maintenance)	___[2]	___[2]	___[2]	___[2]
Monitoring				
Education and Public Information Program				
Planning/Program Development	20,000	10,000		
Implementation (Capital, Operations & Maintenance)	28,000	26,000	30,000	30,000
Monitoring		4,000	4,000	4,000
Recycling - Curbside Collection				
Planning/Program Development	14,000	10,000		
Implementation (Capital, Operations & Maintenance)	90,000	135,000	145,000	145,000
Monitoring		4,000	4,000	4,000
Recycling - Multi-family Curbside Collection				
Planning/Program Development	5,000	5,000		
Implementation (Capital, Operations & Maintenance)	2,500	15,000	35,000	35,000
Monitoring		2,000	2,000	2,000
Recycling - Commercial Collection				
Planning/Program Development	9,000	10,000		
Implementation (Capital, Operations & Maintenance)	4,000	25,000	60,000	60,000
Monitoring		3,000	4,000	4,000
Recycling - Salvage at Solid Waste Facilities				
Planning/Program Development	8,000	4,000		
Implementation (Capital, Operations & Maintenance)	20,000	40,000	44,000	44,000
Monitoring		3,000	3,000	3,000

Table 9-1
Funds Required for Planning, Implementation, and Monitoring of Programs
to be Implemented in the Short-Term Planning Period[1]

	1992	1993	1994	1995
Composting - Yard Waste Processing				
Planning/Program Development		20,000	17,000	
Implementation (Capital, Operations & Maintenance)		14,000	80,000	83,000
Monitoring			3,000	3,000
Recycling/Composting/Public Education Program Coordinator[3]	38,000	38,000	38,000	38,000
TOTAL	**238,500**	**368,000**	**469,000**	**455,000**

1. In accordance with AB 939, programs scheduled for the medium-term planning period are not included in this table. Costs are in 1991 constant dollars.
2. Costs are included in education and public information program.
3. Cost includes a Salary multiplier of approximately 1.4 for benefits.

10 INTEGRATION COMPONENT

A jurisdiction must integrate source reduction, recycling, composting, and special wastes programs and activities to achieve the diversion requirements mandated by AB 939. These components must also be integrated as necessary so that solid waste management follows the integrated waste management hierarchy of (1) source reduction, (2) recycling and composting, and (3) environmentally safe transformation and disposal.

This component contains a description of the solid waste management practices that promote integrated waste management in the City of Morgan Hill, and an explanation of how the City has integrated the Source Reduction, Recycling, Composting, Special Waste, and Public Information components. In addition, this component summarizes how the 25 percent and 50 percent diversion mandates will be achieved, and how priorities were established between the components consistent with the requirements of AB 939. This component also contains an integrated schedule.

10.1 Integrated Solid Waste Management Practices

The solid waste management practices described in the Source Reduction, Recycling, Composting, and Special Waste components of this document (Sections 3 through 6), which are to be continued, expanded, or implemented in the City of Morgan Hill, are designed to comply with the integrated waste management hierarchy established by AB 939. Consistent with this hierarchy, the City will promote source reduction activities targeted at decreasing the amount of solid wastes being generated in the City. For wastes that continue to be generated in the City, recycling and composting programs will contribute to diverting wastes from disposal to the extent feasible. For wastes that cannot be diverted, the City will ensure that they are transformed or disposed of in an environmentally safe manner.

10.2 Component Integration

The Source Reduction, Recycling, Composting, and Special Wastes components have been integrated so that the programs selected for implementation from each component achieve their maximum potential. Initially, mutually exclusive objectives and target materials for each component were developed to prevent overlapping or duplication of activities or programs selected for one component with those of another component. Moreover, the objectives and target materials identified for each component were structured to avoid duplicating the existing source reduction, recycling, and composting activities in the City. With its focus on mutually exclusive programs and activities, the SRRE maximizes the use of all feasible source reduction, recycling, and composting options.

Public education and information, as well as funding for source reduction, recycling, and composting activities and programs, will be integrated in the interest of efficiency and cost effectiveness. All funding requirements will be met by the jurisdiction's waste collection fees until such time as a different funding mechanism for solid waste activities might be developed.

10.3 Compliance with Diversion Mandates

The City of Morgan Hill currently diverts approximately 6.9 percent of the solid waste generated in the City from disposal through existing diversion programs. The source reduction, recycling, composting, and special waste activities and programs selected for implementation are designed to achieve the diversion mandates in AB 939 in coordination with existing (and planned expansions of existing) diversion programs.

Presented on the following page is a summary of the City's integration components and their corresponding diversion targets for the short-term and medium-term planning periods.

Integration Component	Diversion Percentage By 1995	Diversion Percentage By 2000
Recycling	9.1	27.4
Composting	10.6	17.4
Special Waste	0.5	0.5
Total Annual Diversion	20.2	45.3
Existing Diversion (1990)[1]	6.9	6.9
Total Diversion, New and Existing Programs	**27.1**	**52.2**

1. Source reduction is included in existing diversion.
2. See Table 2-3 for waste diverted by year.

10.4 Component Priorities

Some materials in the waste stream may be diverted from land disposal by a variety of methods. Paper, for example, is a target material that may be diverted from landfilling through several programs, including (but not limited to) product reuse, curbside recycling, and commercial recycling.

In developing the SRRE, priorities were established between components for cases involving various available diversion options. Prioritizing between the specific components and programs or activities for each target material was based on several regulatory, technical, institutional, and economic considerations. These included the following:

- location of the activity or program in the integrated waste management hierarchy
- effectiveness in reducing the volume, weight, or hazard of the targeted wastes
- consistency with existing waste management practices
- cost effectiveness and ease of implementation

Based on these criteria, the components of this SRRE were prioritized to effectively achieve the mandated diversion goals of 25 percent by 1995 and 50 percent by 2000.

Table 10-1
1991-1995 Implementation Schedule

Component	Program	Program Implementation Tasks	Start Date	Responsible Agency	Funding Source
Source Reduction	Public Education	Prepare pamphlet encouraging the re-use of items and the purchase of durable products; develop home composting brochure; and encourage the use of source reduction practices; distribute a "junk mail" reduction pamphlet	Mid-1992	Community Development Department	Refuse Fund
Recycling	Curbside Collection	With franchisee, determine method of collection and equipment required; identify end markets	Mid-1992	Community Development Department	Refuse Fund
Recycling	Curbside Collection Program	With franchisee, implement program and temporary MRF if required publicize to residents	Mid-1992	Community Development Department	Refuse Fund
Recycling	Salvage at Solid Waste Facilities	With franchisee, develop receiving and storage area design at the landfill	Mid-1992	Community Development Department	Refuse Fund
Recycling	Salvage at Solid Waste facilities	With franchisee, develop contracts for the marketing of collected materials	Mid-1992	Community Development Department	Refuse Fund
Recycling	Salvage at Solid Waste facilities	With franchisee, develop rate structure to provide incentives for self-haulers and roll-off box customers to deliver segregated loads	Mid-1992	Community Development Department	Refuse Fund
Education and Public Information	Outreach	Mail brochures to residents and businesses announcing new recycling programs; develop a volunteer training packet; solicit for volunteers; train neighborhood recycling advocates	Mid-1992	Community Development Department	Refuse Fund
Education and Public Information	Education	Prepare articles on various waste reduction programs for City newsletter; distribute a source reduction checklist; distribute a "buy-recycled" pamphlet to residents	Mid-1992	Community Development Department	Refuse Fund
Education and Public Information	Outreach	Implement waste reduction measures at local events, coordinate efforts with community groups	Mid-1992	Community Development Department	Refuse Fund

Table 10-1
1991-1995 Implementation Schedule

Component	Program	Program Implementation Tasks	Start Date	Responsible Agency	Funding Source
Recycling	Salvage at Solid Waste Facilities	With franchisee, construct landfill receiving and storage area improvements	Late-1992	Community Development Department	Refuse Fund
Recycling	Commercial/Industrial Collection	With franchisee, determine method of collection and equipment required	Late-1992	Community Development Department	Refuse Fund
Recycling	Multi-family dwelling	With franchisee, determine method of collection and equipment required Collection	Late-1992	Community Development Department	Refuse Fund
Special Waste	Waste Tire Recycling	Coordinate with SVRD, Inc. to locate a waste tire recycler; negotiate and ratify agreement with waste tire recycler	Late-1992	Community Development Department	Refuse Fund
Education and Public Information	Technical Assistance	Publicize and disseminate information on reducing unwanted junk mail	Late-1992	Community Development Department	Refuse Fund
Education and Public Information	Technical Assistance	Establish a speakers bureau, conduct workshops and seminars; provide technical assistance for businesses	Early-1993	Community Development Department	Refuse Fund
Education and Public Information	Environmental Education Curriculum	Establish an integrated waste management curriculum for schools	Early-1993	Community Development Department	Refuse Fund
Education and Public Information	Education	Conduct field trips and facility tours of waste management facilities and model recycling programs	Early-1993	Community Development Department	Refuse Fund
Special Waste	Waste Tire Recycling	With franchisee, initiate tire diversion program	Early-1993	Community Development Department	Refuse Fund

Table 10-1
1991-1995 Implementation Schedule

Component	Program	Program Implementation Tasks	Start Date	Responsible Agency	Funding Source
Recycling	Source separated recycling program: multi-family dwellings	With franchisee, set up pilot programs at different types of multi-family facilities to gauge best type of program or equipment	Mid-1993	Community Development Department	Refuse Fund
Recycling	Commercial/Industrial Recycling Program	With franchisee, set up pilot program to gauge best type of program and a temporary MRF, if required	Mid-1993	Community Development Department	Refuse Fund
Recycling	Salvage at Solid Waste Facilities	With franchisee, begin salvage/drop-off operation	Mid-1993	Community Development Department	Refuse Fund
Composting	Windrow Composting Program	With franchisee, conduct market analysis	Mid-1993	Community Development Department	Refuse Fund
Composting	Windrow Composting Program	Contract for yardwaste processing and compost distribution services or develop compost process and facility design; obtain funding and necessary permits	Late-1993	Community Development Department	Refuse Fund
Education and Public Information	Information	Disseminate information on recycling and composting programs via utility bill inserts, PSAs, news releases, and radio and television appearances	Late-1993	Community Development Department	Refuse Fund
Source Reduction	On-Site Composting and Xeriscaping	Encourage use of on-site mulching of grass clippings on all residential lawns; conduct workshops	Late-1993	Community Development Department	Refuse Fund
Education and Public Information	Technical Assistance	Offer homeowners and businesses assistance with on-site composting, xeriscaping, and mulching; promote composting as a method to reduce landfill disposal costs	Late-1993	Community Development Department	Refuse Fund
Education and Public Information	Public Awareness	Disseminate promotional materials; establish contests and displays; develop a composting exhibit	Late-1993	Community Development Department	Refuse Fund

Table 10-1
1991-1995 Implementation Schedule

Component	Program	Program Implementation Tasks	Start Date	Responsible Agency	Funding Source
Source Reduction	Technical Assistance	Develop source reduction checklists to be posted at local supermarkets	Early-1994	Community Development Department	Refuse Fund
Recycling	Commercial/Industrial Recycling Program	With franchisee, expand program to full-scale	Early-1994	Community Development Department	Refuse Fund
Recycling	Source separated recycling program: multi-family dwellings	With franchisee, expand program to full-scale	Early-1994	Community Development Department	Refuse Fund
Education and Public Information	Technical Assistance	Establish a public recognition and awards program	Early-1994	Community Development Department	Refuse Fund
Composting	Windrow Composting Program	With franchisee, perform facility/site improvements; purchase and install processing equipment for pilot	Early-1994	Community Development Department	Refuse Fund
Composting	Windrow Composting Program	With franchisee, startup pilot program	Mid-1994	Community Development Department	Refuse Fund
Composting	Windrow Composting Program	With franchisee, perform laboratory analyses	Early-1995	Community Development Department	Refuse Fund
Composting	Windrow Composting Program	With franchisee, expand to full program	Mid-1995	Community Development Department	Refuse Fund
Recycling	Manual and Mechanized Material Recovery Operations	With franchisee, formalize interjurisdicational relationships for MRF	Mid-1995	Community Development Department	Refuse Fund

Notes: (1) SVRD refers to South Valley Refuse and Disposal Company, Inc.

Appendix 1
EVALUATION APPROACH

EVALUATION APPROACH

Evaluation Criteria

The *Planning Guidelines and Procedures for Preparing and Revising Countywide Integrated Waste Management Plans, Section 18733.3, Chapter 9, Division 7, Title 14, California Code of Regulations,* require certain criteria to be used in evaluating alternative programs that are identified in the source reduction, recycling, composting, and special wastes components. These criteria reflect a broad range of technical, economic, and socio-political considerations. The evaluation criteria are described below in light of their application to integrated waste management programs. In addition, a rating system is provided for each criterion; a brief explanation of the rating is included for each of the criteria.

1. Effectiveness

Effectiveness is the relative effectiveness of the alternative in reducing the amount of targeted material(s) in the solid waste stream. This criterion is rated as follows:

High:	effective
Medium:	negligible effect
Low:	ineffective

2. Hazard[1]

Hazard refers to the potential hazards that are created by the alternative. Hazards can include health risks, injury, fire, or others identified for the alternative. A high rating corresponds to few or no potential hazards. This criterion is rated as follows:

---

[1] Note that several of the criteria—hazard, institutional barriers, and consequences on the waste stream—are inherently negative. A rating of high for these criteria corresponds to few or no impacts associated with these potential problems.

High: There are few or no potential hazards. All potential hazards can be controlled.

Medium: There are some potential hazards that, for the most part, can be controlled.

Low: Potential hazards exist that are not completely understood or controllable, or the alternative increases the potential hazards.

3. Ability to Accommodate Change

Ability to Accommodate Change refers to the alternative's ability to accommodate changing economic, technological, and social conditions. This criterion is rated as follows:

High: The alternative is anticipated to be readily adaptable in meeting changing conditions. Significant changes in the program are not anticipated.

Medium: The alternative is anticipated to demonstrate a moderate ability to respond to changing conditions. Significant changes in the program may be required.

Low: The alternative has a limited ability to respond to changing conditions. Limitations may include inflexible or unpredictable markets for diverted materials, existing contracts with waste management companies, operational limitations, unwillingness of the public to participate in programs, or others identified for the alternative.

4. Consequences on the Waste Stream

Consequences on the Waste Stream reflects the impacts of the alternative on the waste stream. These impacts include shifts in the type of waste generated or the composition of the wastes, as well as other characteristic changes, such as waste density, moisture content, and heating value. This criterion is rated as follows:

High: The alternative would not result in the creation of non-recyclable, unmarketable, or otherwise undesirable materials, or materials that are not creditable under AB 939.

Medium: The alternative would result in the creation of little non-recyclable, unmarketable, or otherwise undesirable materials, or materials that are not creditable under AB 939.

Low: The alternative would significantly shift solid waste production toward non-recyclable, unmarketable, and otherwise undesirable materials; or materials that are not creditable under AB 939.

5. Implementation Period

Implementation Period refers to the potential for implementing the alternative in the short-term or medium-term planning periods. This criterion is rated as follows:

High: Implementation of the alternative is anticipated to be completed by 1995.

Medium: Implementation of the alternative is anticipated to be completed by 2000.

Low: Implementation of the alternative could not be completed until after 2000.

6. Facility Requirements

Facility Requirements refers to the need for expanding existing facilities or building new facilities to support the implementation of the alternative. This criterion is rated as follows:

High: The alternative can be easily integrated into existing facilities.

Medium: Existing facilities must be expanded or altered to accommodate implementation of the alternative.

Low: New facilities must be developed to accommodate implementation of the alternative.

7. Consistency with Local Plans and Policies

Consistency with Local Plans and Policies reflects the alternative's consistency with local conditions, including local plans, policies, or ordinances. This criterion is rated as follows:

High: There are no existing local plans, policies, or ordinances that would impede the implementation of the alternative.

Medium: The alternative would require minor changes to existing local plans, policies, or ordinances for implementation.

Low: The alternative would require major changes to existing local plans, policies, or ordinances for implementation.

8. Institutional Barriers

Institutional Barriers refers to the potential for institutional barriers (such as long-term franchise agreements or other contracts), to impact the implementation of the alternative. This criterion is rated as follows:

High: There are no existing institutional barriers to the alternative.

Medium: The alternative is impacted by existing institutional barriers over which the jurisdiction maintains some control.

Low: The alternative is impacted by existing institutional barriers that are not under the control of the jurisdiction.

9. Estimated Cost

Estimated Cost reflects the estimated order-of-magnitude implementation costs of the alternative, including capital costs and operating costs. A high rating corresponds to a relatively low order-of-magnitude cost. This criterion is rated as follows:

High:	$0-50,000
Medium:	$50,000-200,000
Low:	> $200,000

10. End Uses

End Uses reflects the availability of markets for the diverted materials. This criterion is rated as follows:

High:	Available end uses are relatively stable.
Medium:	End uses are available, but are subject to moderate fluctuations. The potential for the development of short-term markets may exist.
Low:	End uses are currently unavailable or unreliable, though the potential for the development of long-term or medium-term markets may exist.

Appendix 2
DISPOSED WASTE CHARACTERIZATION STUDY

CalRecovery
INCORPORATED

Waste management consultants with offices nationwide

Via Facsimile
#408/779-3117

October 13, 1992
File 10376/1299C

Ms. Maura Finnerty
City of Morgan Hill
17555 Peak Avenue
Morgan Hill, CA 95037

Re: Waste Characterization Study for South Santa Clara County

Dear Ms. Finnerty:

In response to your telephone call last week, I have reviewed our files on the above referenced project which was conducted under contract to the County. Our work involved conducting a disposed waste characterization study to develop data that the cities could use in preparation of their SRREs.

Although our contract does not require CalRecovery to reply to questions and comments from the CIWMB, we are providing responses to the three questions that you sent us by fax, as requested.

1) Sampling Methodology of Solid Waste Collection Vehicles:

The as needed procedures for selection of vehicle loads provides an unbiased method of selection because the investigator has no prior knowledge of the contents or history of the load and no basis (other than the need to sort) upon which to objectively select one vehicle over another.

2) Accuracy Statement:

Section 18724(f) of the CIWMB regulations specifies that sampling should be conducted using sampling procedures in Appendix 1 (i.e., either the Klee and Carruth method, or the ASTM method). This study was conducted using the ASTM method (which was authored by George Savage of CalRecovery). The ASTM method does not specify that a waste type, rather than a waste category, be chosen as a governing component. We suggest that the 4th sentence in the Accuracy Statement subsection of the report be changed to read as follows: "The selection of the 0.3 value for coefficient of variation is

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A4 -> A4

based on the average and standard deviations of component compositions (in particular but not exclusively, the total paper category (selected as the governing component for this study) as noted below) measured in previous waste characterizations in California after 1984."

3) Sampling Methodology for Self-Haul Waste:

During the sampling period, approximately 34% of the disposed self-haul waste loads were attributed to the City of Morgan Hill. The number of loads sampled represents a large percentage of the self-haul loads delivered to the landfill. This high rate of sampling provided a representative composition of the City's self-haul waste stream.

I trust that these responses will meet your needs in responding the comments received from the CIWMB. CalRecovery would be pleased to assist to the City in implementing its recycling or composting programs, in developing Requests for Proposals for facilities, or in other areas of solid waste planning and implementation. Please let us know if we can be of help.

Sincerely,

Linda L. Eggerth

Linda L. Eggerth
Senior Vice President

CC:Margaret Rands, Santa Clara County

Final

Disposed Waste Characterization Study

Submitted to

City of Morgan Hill
Santa Clara County

by

CalRecovery
INCORPORATED

July 1991

Report 1299

Final

DISPOSED WASTE CHARACTERIZATION STUDY

Submitted to:

City of Morgan Hill

Santa Clara County

by:

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

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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 south Santa Clara County (South County). The South County area is composed of the following jurisdictions: 1) unincorporated south Santa Clara County; 2) City of Gilroy; and 3) City of Morgan Hill.

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 respective jurisdictions.

CURRENT SOLID WASTE DISPOSAL PRACTICES

With a few minor exceptions, the permitted solid waste facilities that receive solid waste from the three jurisdictions are: 1) the San Martin Transfer Station and Recycling Center (14080 Llagas Avenue, in unincorporated San Martin); and 2) the Pacheco Pass Sanitary Landfill (east of Gilroy, off Pacheco Pass Highway and Bloomfield Road). The San Martin Transfer Station receives compacted wastes from the unincorporated South County and from the City of Morgan

Hill. The transfer station also accepts self-haul wastes from all three jurisdictions. Solid wastes received at the transfer station are then compacted and transferred to trailers. Thereafter, the wastes are hauled approximately 10 miles to the Pacheco Pass Sanitary Landfill for disposal. The Pacheco Pass Sanitary Landfill receives compacted wastes directly from the City of Gilroy, but does not accept public self-haul waste. See Figure 1a regarding typical South County disposal patterns.

SAMPLING METHODOLOGY OF SOLID WASTE COLLECTION VEHICLES

A Test Plan which outlines the field and sorting activities for the three jurisdictions and lists the disposed waste components for sorting is included as Appendix A. The CIWMB has found that the waste categories and types presented herein 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. Because of the lists' statewide uniform application, it will allow the Board to compare the appropriateness of a jurisdiction's chosen diversion methods with the quantities and types of waste currently disposed. For further clarification, the following California Integrated Waste Management Board (CIWMB) definitions are used when referring to residential, commercial, and industrial wastes. A brief description as to how these waste 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.

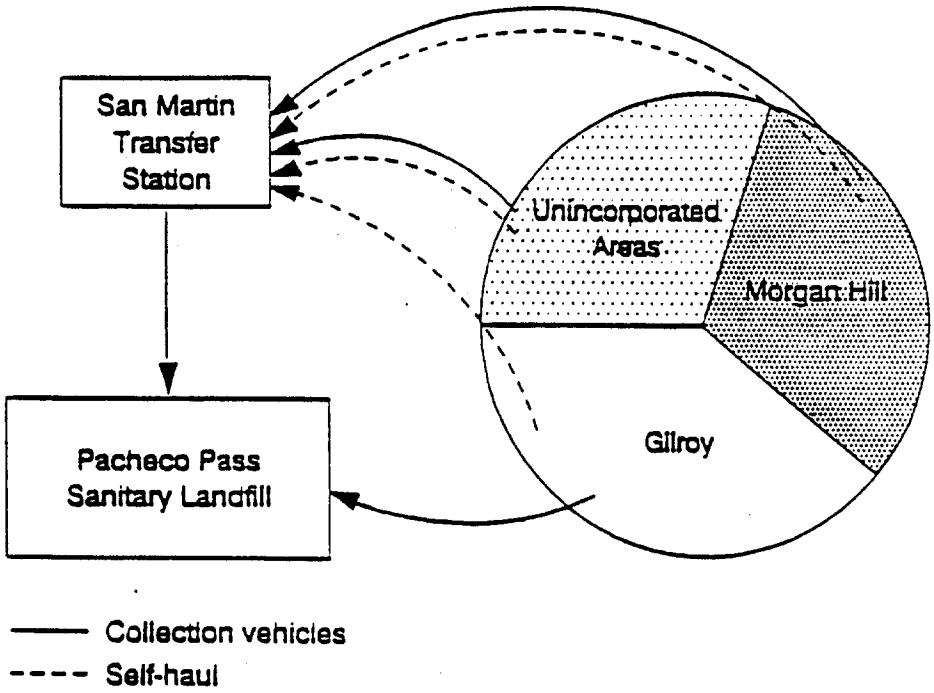

Figure 1a. Typical Disposal Pattern for South Santa Clara County

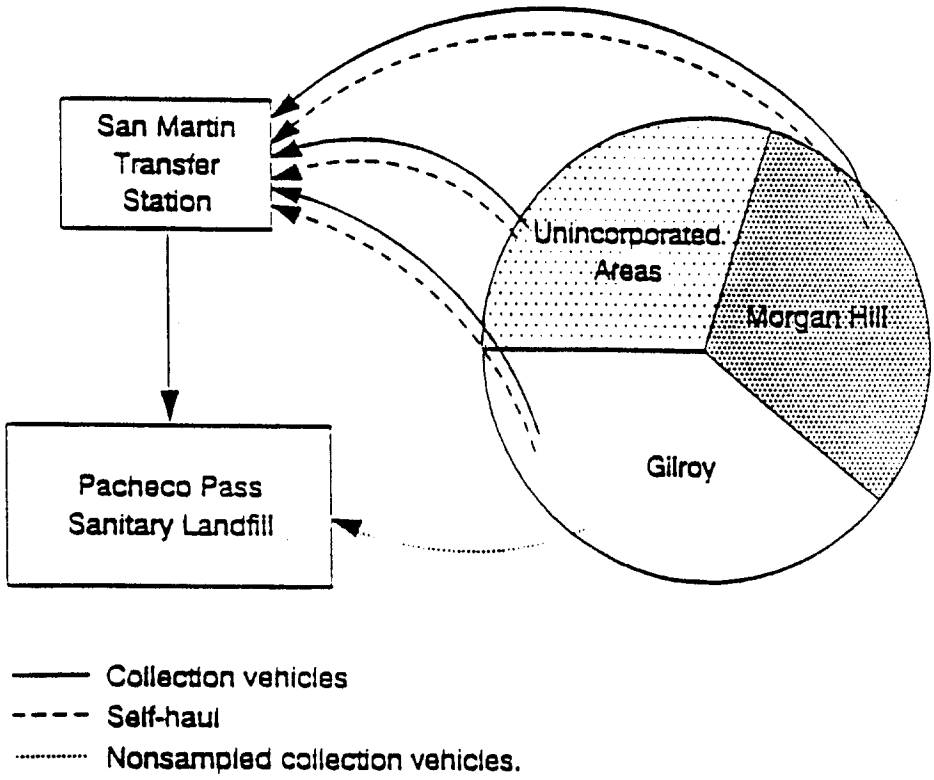

Figure 1b. Study Period Disposal Pattern for South Santa Clara County

The characterization of disposed waste from solid waste collection vehicles was conducted from April 1 to 5, 1991 at the San Martin Transfer Station and Recycling Center. Assistance in the study was provided by South Valley Refuse Disposal, Inc. (SVRD). Initial discussions with SVRD prior to sampling, provided background information regarding jurisdictional boundaries, hauler routes, and frequency of collection of solid waste. In order to consolidate the sampling and sorting procedure in one location, SVRD routed solid waste collection vehicles which serve the City of Gilroy directly to the transfer station (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 SVRD background data, each jurisdiction's daily residential, commercial, and industrial waste sources could be readily sampled on an as-needed basis during the week of sampling to reflect each jurisdiction's waste stream. The as-needed procedure for selection of vehicle loads provided an unbiased method of selection of representative vehicle loads of waste. This method presents no bias 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.

SVRD further assisted in confirming waste sources (via route logbooks), 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 ($\bar{x}$) of each jurisdiction's composite disposed waste sources at the 90% level of confidence for the majority of waste categories (see Test Plan in Appendix A). The jurisdiction's composite disposed waste stream is defined as the sum of its waste from residential, commercial, and industrial sources. Because jurisdiction-specific composition data were not available at the time of this study, the Test Plan assumes a coefficient of variation of 0.3 ($s/\bar{x}$) among the majority of waste categories. The selection of the 0.3 value for coefficient of variation is based on the average and standard deviations of component compositions (in particular but not exclusively, the total paper category as noted below) measured in previous waste characterizations in California after 1984. For example, the residential and commercial <u>total</u> paper average compositions ($\bar{x}$) 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):

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

where t^* is the t-statistic and $s/\bar{x}$ is the coefficient of variation. Through substitution:

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

$$n \approx 12$$

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

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

$$n \approx 13$$

Under these conditions, the minimum number of samples that should be collected for each jurisdiction is 13. The actual number of samples analyzed in the field for each jurisdiction was in the range of 16 to 24.

NUMBER OF VEHICLES SAMPLED

The proposed as well as 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. Proposed and Actual Number of Vehicles Sampled for the South Santa Clara County Disposed Waste Field Analysis (April 1-7, 1991)

	Gilroy		Morgan Hill		Unincorporated		Total	
Waste Source	**Proposed**	**Actual**	**Proposed**	**Actual**	**Proposed**	**Actual**	**Proposed**	**Actual**
Residential	8	8	8	9	7	7	23	24
Commercial	6	5	6	7	6	6	18	18
Industrial	5	3	5	8	5	6	15	17
TOTALS	**19**	**16**	**19**	**24**	**18**	**19**	**56**	**59**

SAMPLING METHODOLOGY FOR SELF-HAUL WASTE

A visual survey of the self-haul waste was conducted from April 1 to 7, 1991 at the San Martin Transfer Station. The visual inspection included observation at the transfer station on Saturday and Sunday to account for increased public usage and potential variation in composition of the waste compared to that delivered Monday through Friday.

The main sources of this waste type 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 uncompacted self-haul waste. Programs selected for implementation to meet the required 25% and 50% diversion goals can be better determined if self-haul is addressed as a separate waste source.

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 is typically bulky and relatively uniform, trained field observers were able to analyze and record a large number of samples. Over 580 vehicles were visually surveyed for volume, waste type, and composition for the three jurisdictions.

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 do not fit 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 recorded the origin (jurisdiction) of self-haul loads during the entire sampling period. This information provided a means for apportionment of quantity data to each jurisdiction. Composition and quantity data for self-haul waste were developed based on discussions with hauler and transfer station personnel, field observations and measurements by CalRecovery, and 6 months of data reported from the scalehouse.

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 set forth 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 floor. The following items were included in the "Other Misc. Organics" category: diapers, animal refuse, and other organic materials. Diapers comprise greater than 50% of the "Other Misc. Organics" waste. The "Inerts Solids" category included the following items: dirt, brick, concrete, and other inert substances.

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

RESIDENTIAL WASTES

Vehicles containing residential waste were sampled each day during the five-day collection vehicle sample period.

Table 2. Average Composition (% Weight) and Annual Quantities (Tons/Year) of Disposed Waste.

Morgan Hill
April 1-7, 1991
Waste Characterization

	Waste Source									
	Residential N = 9		Commercial N = 7		Industrial N = 8		Self Haul (Visual)		Total Disposed	
Material	%	TPY	%	TPY	%	TPY	%	TPY	%	TPY
1) TOTAL PAPER	36.2	2723	41.9	3020	13.4	909	13.9	959	26.8	7610
OCC/Kraft	6.1	460	14.8	1068	6.1	413	5.7	393	8.2	2334
Mixed Paper	9.2	694	10.6	763	4.5	308	1.5	107	6.6	1871
Newsprint	9.9	747	3.5	253	0.6	38	1.0	72	3.9	1111
High-Grade	0.2	18	1.6	117	0.0	0	0.3	18	0.5	154
Magazines/Glossy ins.	2.7	207	2.1	149	0.0	0	0.2	12	1.3	367
Other Paper	7.9	598	9.3	670	2.2	150	5.2	358	6.2	1774
2) TOTAL PLASTICS	6.9	521	6.5	470	6.1	412	4.8	330	6.1	1732
HDPE	0.6	46	0.6	41	0.8	55	0.2	13	0.5	156
PET	0.3	25	0.1	5	0.4	30	0.0	1	0.2	60
Film	3.7	277	4.0	290	1.1	73	3.3	229	3.1	869
Polystyrene foam	0.3	20	0.5	33	0.5	34	0.1	8	0.3	95
Other Plastics	2.0	152	1.4	101	3.3	220	1.1	78	1.9	552
3) TOTAL GLASS	4.7	356	2.5	182	0.4	30	1.2	86	2.3	653
Refillable Glass Bev.	0.0	3	0.0	1	0.0	0	0.1	4	0.0	7
Calif. Redemption Value	2.4	180	1.2	88	0.2	13	0.1	7	1.0	288
Other Recyclable	2.3	172	1.3	92	0.3	17	0.1	8	1.0	290
Other Non-Recyclable	0.0	0	0.0	1	0.0	0	1.0	67	0.2	68
4) TOTAL METALS	9.8	733	5.0	363	17.9	1215	10.4	716	10.7	3027
Aluminum Cans	0.3	25	0.2	13	0.8	51	0.0	3	0.3	92
Bimetal Cans	0.0	2	0.0	0	0.0	0	0.4	25	0.1	27
Tin F&B Cans	1.4	105	0.7	51	0.6	42	1.3	87	1.0	286
Other Aluminum	5.5	410	3.0	213	2.6	178	0.2	13	2.9	814
Other Ferrous	2.5	191	1.2	85	13.9	939	6.9	474	6.0	1690
Non-Ferrous	0.0	0	0.0	0	0.1	4	0.0	0	0.0	5
White Goods	0.0	0	0.0	0	0.0	0	1.6	113	0.4	113
5) YARD WASTES	23.3	1754	17.0	1223	2.9	195	26.8	1846	17.7	5019
6) OTHER ORGANICS	17.6	1325	25.3	1820	56.1	3800	30.7	2120	31.9	9066
Food	6.7	507	15.8	1136	0.0	0	1.8	122	6.2	1764
Tires/Rubber	0.3	24	0.2	17	2.0	136	0.3	20	0.7	196
Wood	3.2	243	3.0	217	24.6	1664	22.9	1580	13.0	3704
Ag. Crop Residue	0.0	0	0.0	0	0.0	0	3.3	226	0.8	226
Manure	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Textiles/Leather	3.2	240	2.4	175	8.9	600	0.0	0	3.6	1014
Other Misc. Organics	4.2	312	3.8	276	20.7	1401	2.5	173	7.6	2162
7) OTHER WASTES	1.3	95	1.5	112	3.2	216	12.1	836	4.4	1259
Inert Solids	1.2	88	1.3	95	3.1	212	12.1	835	4.3	1229
HHW	0.1	7	0.2	17	0.1	4	0.0	1	0.1	30
8) OTHER SPECIAL WASTES a)	0.2	13	0.2	17	0.0	0	0.0	3	0.1	32
Total	100.0	7520	100.0	7208	100.0	6776	100.0	6896	100.0	28398

Average may not sum to 100% due to rounding.
a) Small Household Appliances

TPY = Tons Per Year
N = Number of Vehicles Samples

As shown in Table 2, the total paper category is the largest component (36.2%) of the disposed residential waste stream. Newsprint alone comprises approximately 9.9% of this category. Yard waste comprises 23.3% of the waste stream and is the single largest contributor to the residential waste stream.

COMMERCIAL WASTES

Generators of commercial waste were sampled randomly from front- and rear-loaders. SVRD personnel were available throughout 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 greater than one-third (41.9%) of the commercial disposed waste consists of paper products. During the sampling period, approximately 5% of the total amount of OCC weighed was identified as being contaminated (i.e., waxed, oil soaked, etc.). Though this 5% is of the total amount of OCC disposed, large amounts of OCC generally occur in commercial wastes. In the case of Morgan Hill, the highest contributor of OCC is the commercial waste stream.

Approximately one-quarter (25.3%) of the disposed commercial waste consists of the Other Organics category, with food wastes being the largest waste type of this category at 15.8%.

INDUSTRIAL WASTES

Table 2 shows that 56.1% of the disposed industrial waste stream is Other Organics, almost half (24.6%) of which is wood wastes.

Though the Industrial "Total Plastics" composition was comparable to the other two jurisdictions, a number of samples contained PVC and other plastic piping which may have been damaged by weather conditions. This is reflected in the "Other Plastics" waste type average composition.

SELF-HAUL WASTES

Self-haul waste constitutes a significant portion (approximately 24%) of the City's disposed solid waste. Of this total, approximately 30% can be attributed to loads categorized as yard

debris, 12% as construction/demolition debris, less than 1% as dirt/rubble, and approximately 55% as miscellaneous. Self-haul wastes originating in Morgan Hill comprised approximately 34% of all the self-haul wastes delivered to the transfer station during the study period. Self-haul vehicles delivered, on average, a 1.6 cubic yard load to the transfer station during the field study.

The apportionment of respective waste quantities and the estimated yearly disposed self-haul quantities are based on discussions with landfill and hauler representatives, field observations by CalRecovery, and data supplied by the landfill scalehouse.

SEASONALITY

It has been assumed that four seasons could potentially impact the disposed wastes in Morgan Hill. 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 self-haul quantities supplied for the sampling period were based on the weekly quantity reported to the scalehouse during the sampling period. The self-haul quantity for the period was then multiplied by 52 weeks to estimate annual quantities.

The potential seasonal impacts on the remainder of Morgan Hill's waste stream were considered based on the following factors: demographics of the area, degree of commercial development, local meteorology, the results of the disposed waste characterization, and the results of seasonal waste characterization studies conducted for the City and County of San Francisco (1985/86),[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 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%

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.

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 3. Figure 2 presents the total projected quantities graphically. The projected quantities are based on population projections which were supplied to CalRecovery by the jurisdiction. The Morgan Hill population projections were based on those in the City's General Plan. If necessary, population data were interpolated to provide yearly estimates. 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 Morgan Hill (Tons/Year)

Material	Year:	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
	Population:	23,938	24,544	25,150	25,757	26,363	26,969	27,575	28,181	28,788	29,394	30,000	30,825	31,650	32,475	33,300	34,125
	Esc. factor a):		1.025	1.025	1.024	1.024	1.023	1.022	1.022	1.022	1.021	1.021	1.028	1.027	1.026	1.025	1.025
1) TOTAL PAPER		7610	7803	7996	8188	8381	8574	8767	8959	9152	9345	9538	9800	10062	10324	10587	10849
OCC/Kraft		2334	2393	2452	2511	2570	2629	2688	2747	2806	2865	2925	3005	3085	3166	3246	3327
Mixed Paper		1871	1919	1966	2013	2061	2108	2156	2203	2250	2298	2345	2410	2474	2539	2603	2668
Newsprint		1111	1139	1167	1195	1223	1251	1280	1308	1336	1364	1392	1430	1469	1507	1545	1583
High Grade		154	157	161	165	169	173	177	181	185	189	192	198	203	208	214	219
Magazines/Glossy ins		367	377	386	395	405	414	423	433	442	451	461	473	486	499	511	524
Other Paper		1774	1819	1863	1908	1953	1998	2043	2088	2133	2178	2223	2284	2345	2406	2467	2528
2) TOTAL PLASTICS		1732	1776	1820	1864	1907	1951	1995	2039	2083	2127	2171	2230	2290	2350	2409	2469
HDPE		156	160	164	168	172	176	180	183	187	191	195	201	206	211	217	222
PET		60	62	63	65	67	68	70	71	73	74	76	78	80	82	84	86
Film		869	891	913	935	957	979	1001	1023	1045	1067	1089	1119	1149	1179	1209	1239
Polystyrene foam		95	97	100	102	105	107	109	112	114	117	119	122	125	129	132	135
Other Plastics		552	566	580	594	608	622	635	649	663	677	691	710	729	748	767	786
3) TOTAL GLASS		653	670	686	703	719	736	752	769	785	802	819	841	864	886	909	931
Refillable Glass Bev.		7	7	7	8	8	8	8	8	8	9	9	9	9	10	10	10
Calif. Redemption Value		288	295	303	310	317	325	332	339	347	354	361	371	381	391	401	411
Other Recyclable		290	297	305	312	319	327	334	342	349	356	364	374	384	394	404	414
Other Non-Recyclable		68	70	71	73	75	76	78	80	82	83	85	87	90	92	94	97
4) TOTAL METALS		3027	3104	3181	3257	3334	3411	3487	3564	3641	3717	3794	3898	4003	4107	4211	4316
Aluminum Cans		92	94	97	99	101	104	106	108	111	113	115	118	122	125	128	131
Bimetal Cans		27	28	29	29	30	31	31	32	33	34	34	35	36	37	38	39
Tin F&B Cans		286	293	300	307	315	322	329	336	343	351	358	368	378	387	397	407
Other Aluminum		814	835	856	876	897	917	938	959	979	1000	1020	1049	1077	1105	1133	1161
Other Ferrous		1690	1733	1776	1818	1861	1904	1947	1990	2032	2075	2118	2176	2235	2293	2351	2409
Non Ferrous		5	5	5	5	5	5	5	5	6	6	6	6	6	6	6	7
White Goods		113	116	119	122	125	128	131	134	136	139	142	146	150	154	158	162
5) YARD WASTES		5019	5146	5273	5400	5527	5654	5781	5908	6035	6162	6290	6463	6635	6808	6981	7154
6) OTHER ORGANICS		9066	9295	9525	9755	9984	10214	10443	10673	10902	11132	11362	11674	11987	12299	12611	12924
Food		1764	1809	1854	1898	1943	1988	2032	2077	2122	2166	2211	2272	2333	2393	2454	2515
Tires/Rubber		196	201	206	211	216	221	226	231	236	241	246	252	259	266	273	279
Wood		3704	3798	3891	3985	4079	4173	4267	4360	4454	4548	4642	4769	4897	5025	5152	5280
Ag Crop Residue		226	231	237	243	249	254	260	266	271	277	283	291	298	306	314	322
Manure		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Textiles/Leather		1014	1040	1066	1092	1117	1143	1169	1194	1220	1246	1271	1306	1341	1376	1411	1446
Other Misc. Organics		2162	2216	2271	2326	2381	2435	2490	2545	2600	2654	2709	2784	2858	2933	3007	3082
7) OTHER WASTES		1259	1290	1322	1354	1386	1418	1450	1482	1514	1545	1577	1621	1664	1707	1751	1794
Inert Solids		1229	1260	1291	1322	1354	1385	1416	1447	1478	1509	1540	1583	1625	1667	1710	1752
HHW		30	30	31	32	33	33	34	35	36	36	37	38	39	40	41	42
8) OTHER SPECIAL WASTES b)		32	33	34	34	35	36	37	38	38	39	40	41	42	43	45	46
Total		28398	29117	29836	30555	31275	31994	32713	33432	34151	34870	35589	36568	37547	38526	39504	40483

Total may not sum exactly due to rounding

a) Escalation factor (Esc. factor) is based on percent change in the population data reported by jurisdiction

b) Small Household Appliances

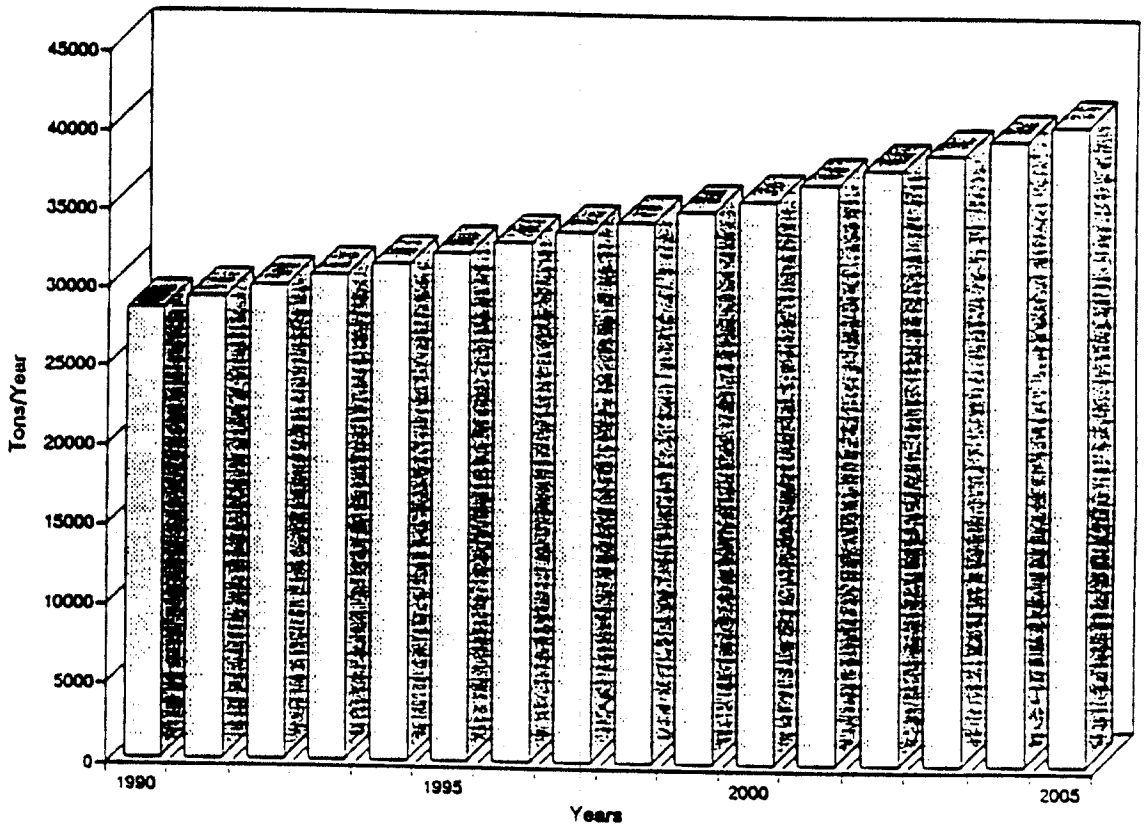

Figure 2. Projected Annual Quantities of Disposed Wastes

Appendix A

SANTA CLARA SOUTH COUNTY AREA

DISPOSED WASTE FIELD ANALYSIS PLAN

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March, 1991

DISPOSED WASTE FIELD ANALYSIS PLAN

INTRODUCTION

This test plan presents the methodology for estimating the composition of solid waste generated within the cities of Gilroy and Morgan Hill and the Unincorporated South County. The field analyses will be conducted at the San Martin Transfer Station during the period of April 1-7 (Monday through Saturday), 1991

SAMPLE COLLECTION AND SORTING METHODS

The methods of sample collection and of sorting will be those of 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 they are present in loads designated for sampling and will be visually surveyed among the 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 the landfill by collection vehicles, self-haul wastes and wastes delivered by small haulers will be visually surveyed go 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. An objective of the analysis is to characterize the overall waste stream from each jurisdiction within an accuracy of approximately 10 to 15%. A selection 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 about 50% of those in the jurisdiction.

WASTE 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.

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

	PAPER	
1		Corrugated/kraft paper
2		Mixed paper
3		Newspaper
4		High grade/office
5		Magazines/glossy
6		Other paper
	PLASTICS	
7		Film
8		PET
9		HDPE
10		Polystyrene foam
11		Other
12	FOOD	
13	YARD WASTE	
14	WOOD	
15	TEXTILES/LEATHER	
16	RUBBER/TIRES	
17	AGRI. CROP RESIDUE	
18	MANURE	
19	OTHER ORGANICS	
	METALS	
20		Steel food and beverage containers
21		Other ferrous
22		Bi-metal cans
23		Aluminum cans
24		Other aluminum
25		Other non-ferrous
	GLASS	
26		Redeemable beverage containers
27		Non-redeemable beverage containers
28		Other recy. glass
29		Other non-recy. glass
30	OTHER INORGANICS/INERTS	
31	WHITE GOODS	
32	HOUSEHOLD HAZARDOUS WASTE	
33.	SPECIAL WASTES (Where applicable)	

Table 2. Sample Field Data Sheet

WASTE COMPOSITION DATA SHEET FOR _____ Sample Notes: _____

JURISDICTION: _____

Day/Date: _____ Truck Co./No.: _____

Residential Sample No.: _____ Truck Type: _____

Recorded By: _____ Waste Type: _____

Component	Cont. Tare	Gross Weights (lb) Tare					No Tare					Total
Corrugated containers												
Mixed paper												
Newspaper												
High grade ledger paper												
Magazines												
Other paper												
Film plastics												
HDPE containers												
PET containers												
Polystyrene												
Other plastics												
Food waste												
Yard waste												
Wood wastes												
Textiles/leather												
Tires/rubber products												
Agricultural crop residues												
Manure												
Other organics												
Tin cans												
Other ferrous												
Bi-metal containers												
Aluminum cans												
Non-ferrous												
Other aluminum												
CA Redemption Value												
Non-redeemable glass												
Other recyclable												
Other non-recyclable												
Other inorganics												
Appliances												
HHW												

Notes on HHW: _____

Misc. Notes: _____

Table 3. Santa Clara South County Sampling Plan

Waste Source	Gilroy	Morgan Hill	Unincorporated	Totals[1]	Small Hauler & Self-Haul
Residential	8	8	7	23	
Commercial	6	6	6	18	
Industrial	5	5	5	15	
Totals	19	19	18	56	

[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 50 to 60.

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:

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

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 $\overline{x}$ 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:

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

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.

Appendix 3
DIVERSION STUDY

Methodology for Solid Waste Diversion Characterization County of Santa Clara

Prepared for

The County of Santa Clara
Department of Planning and Development

May 1991

Prepared by

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Project 654-04.01

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METHODOLOGY FOR SOLID WASTE DIVERSION CHARACTERIZATION COUNTY OF SANTA CLARA

Background

In January of 1991, the County of Santa Clara retained EMCON Associates (EMCON) to conduct a modified solid waste diversion study limited to data available from

- Local secondary materials market outlets
- Recycling collectors
- Materials brokers
- End users
- California certified redemption centers
- City recycling and composting programs
- Transfer station records
- Hauler records

The objective of the County-sponsored waste diversion study was to provide assistance to jurisdictions within the County in the preparation of waste generation studies as part of the AB 939 planning process. No businesses were surveyed as part of this study.

In accordance with Title 14, Chapter 9 of the California Code of Regulations (CCR), the diversion characterization identifies the composition and quantity of solid waste generated within a given jurisdiction that is diverted for a continuous 12-month period after 1984 and prior to the jurisdiction's adoption of the Source Reduction and Recycling Element (SRRE). Diversion refers to the measured amount of waste (1) reduced in the jurisdic-

tion, or (2) generated within a jurisdiction and recycled or composted at sites within or outside of that jurisdiction.

Section 18732 of Chapter 9 of the CCR identifies the following methods as being acceptable for determining diversion:

1. Quantitative field analysis, and/or
2. Materials flow with use of current written records from disposal facilities, and/or
3. Existing disposal data from comparable jurisdictions

In conducting the waste diversion characterization for the County, EMCON selected Method 2 (materials flow plus records). The time period selected for the diversion characterization was the 12-month period, January 1990 through December 1990.

The following surveys were undertaken to obtain waste diversion data:

- a mail survey of collectors and processors of recyclable materials, utilizing a material flow methodology;
- a mail survey of City residential and nonresidential diversion programs; and
- a telephone survey of transfer station and landfill operators

Survey Methodology

Recyclers' survey. Initially EMCON developed a survey form for recyclers, brokers, and end users to determine quantities of waste diverted by material type in 1990. To promote participation in the survey, recyclers were informed that the information that they provided would be reported in aggregate form only, to ensure confidentiality. The survey form identified the need for the following data:

- Business type (e.g., broker, collector, scrap metal dealer, buy-back center, etc.)
- Anticipated percentage increase (or decrease) in recycling tonnage in 1991
- Tonnage of materials collected by type for 1990

- Source of the waste (i.e., residents, commercial businesses, industry, other)
- Purchaser of recyclables (if not end user)

The survey form was reviewed by the County prior to its mailing.

A mailing list of recyclers, brokers, and end users of secondary materials in the area 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

An additional list of 13 recycling collectors and brokers was developed by referrals from other recycling firms.

City programs survey. Next, EMCON prepared a survey form for all the cities within Santa Clara County to obtain data on the quantities of wastes diverted from the residential waste stream (and a portion of the commercial waste stream.)

The survey of city programs requested data on the following residential diversion programs

- Curbside collection program
- Drop-off recycling center(s)
- Buy-back center(s)
- 20/20 center(s)
- Curbside/and waste collection
- Drop-off yard waste program

The survey form sent to cities also requested the following data for commercial-industrial diversion programs:

- Collection of recyclables from commercial businesses by privately owned recycling firms

- Drop-off center(s) for commercial-industrial wastes
- Restaurant-bar glass collection
- High-grade office paper collection
- Cardboard collection program for commercial and retail firms

The County reviewed the survey form prior to its mailing.

The October 1990 mailing list of the Technical Advisory Committee for the Santa Clara County Office of Toxics and Solid Waste Management was the source of the names and addresses for the survey recipients in the 15 jurisdictions within the County. Survey forms were sent to the following:

Campbell - Barbara Lee, City Manager's Office

Cupertino - Bert Viskovich, Director of Public Works

Gilroy - Em Rojas, HCD Coordinator

Los Altos - Bruce Bane, Director of Public Works

Los Altos Hills - Bill Ekern, Director of Public Works

Los Gatos - Regina Falkner, Manager, Community Service Division

Milpitas - Cynthia Rosson, Assistant Planner

Monte Sereno - Rosemary Pierce, Chief Administrative Officer

Morgan Hill - Susan Tosh, Environmental Programs Division, Department of Public Works

Mountain View - Dianne Dryer, Recycling Coordinator

Palo Alto - Mike Miller, Department of Public Works

San Jose - Gary Liss, Solid Waste Manager

Santa Clara - Rick Mauck, Deputy Director/Public Works

Saratoga - Vera Dahle, Solid Waste Program Manager

Sunnyvale - Mark Bowers, Solid Waste Program Manager

Transfer station phone survey . The San Jose Recycling and Transfer Station and the San Martin Transfer Station were surveyed by phone to

obtain data from jurisdictions within Santa Clara County that salvage and recycle. Waste types for which data were collected were:

- Metals, including aluminum, tin, and ferrous metals
- Corrugated cardboard
- Wood
- Yard waste
- Glass

Landfill phone survey. The City surveyed operations at the following landfills by phone to obtain estimates of waste quantities diverted from landfilling:

- All Purpose Landfill
- Guadalupe Landfill
- Pacheco Pass Landfill
- Zanker Road Landfill

Data were obtained from landfill operators on the following waste categories for jurisdictions in Santa Clara County:

- Glass, including CA Redemption Value, refillable beverage containers, and other recyclable glass
- Yard waste
- Metals, including aluminum, ferrous, and non-ferrous metals
- Plastics, including HDPE, PET, film, and other plastics
- Wood waste
- Inert solids, including concrete and asphalt

Summary of Survey Results

Survey recipients. A total of 138 recyclers, brokers, collectors, end users, and operators of transfer stations and landfills were surveyed as part of the City's waste diversion characterization. A breakdown by category of those surveyed is as follows:

1. Bay Area Recyclers' List - 119 recyclers, collectors and brokers received surveys.

2. Additional 13 recyclers and collectors (not on Bay Area Recyclers' list).

3. Transfer stations and landfills (a total of 6 facilities).

Survey response. Of the 138 recyclers and operators of transfer stations and landfills who responded to the mail survey and/or phone survey, 49 responded, for a response rate of 36 percent. A breakdown of the responses by category is as follows:

- 132 recyclers, brokers, collectors and end users were surveyed; 41 replied, for a response rate of 31 percent
- 6 operators of landfills and transfer stations were surveyed and all responded, for a response rate of 100 percent.

In addition, all of the jurisdictions within the County responded to the mail survey of recycling and composting programs.

Data Reduction, Interpretation, and Assumptions

Cross checking. To avoid double counting the data provided by recyclers, collectors, and end users, the material flow was charted for each waste type for which information was provided. 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 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 each jurisdiction.

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. Source reduction data for diapers was calculated using a conversion factor from a document entitled *Diapers in the Waste Stream*[1]. 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)

Data apportioning and assumptions. When data were available only in the aggregate, EMCON apportioned the data to specific jurisdictions based on the population ratio of those areas for which data were reported, based on ABAG's *Projections '90.*

In reviewing the data provided in the "Diversion Quantities" tables prepared for each jurisdiction, one should note the following assumptions:

1. A column entitled "transformation" was provided in each table to enable jurisdictions to use this table as a model to record this information for future SRRE revisions. As specified in AB 939, after January 1, 1995, up to 10 percent of transformation (incineration, pyrolysis, and other processes) can count toward the 50 percent diversion target (by 2000), provided that the front-end removal of recyclable materials and other specified conditions are met.

2. 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.

3. Data for industrial wastes are included in the table with commercial waste data (except where specifically listed)

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1 Lehrburger, Carl, *Diapers in the Waste Stream:* A Review of Waste Management and Public Policy Issues, December 1988.

because collectors do not distinguish by source in their records.

4. Apartment recycling is generally not reported separately from residential recycling. However, because of the different type of collection system, a column is provided in the diversion data table for each city 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.

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.

Method for Calculating Diversion Rate

"Diversion Quantities" tables for residential and nonresidential wastes were prepared for each jurisdiction by tabulating the tons diverted by material type in 1990. These tables can be used by each jurisdiction to calculate percentage diversion rates by waste type after the total waste disposal quantities have been determined.

When combined, the results of the disposal and diversion characterization yield the total amount of solid waste generated, according to the equation 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.

The methodology for calculating the diversion rate (after the total quantity of waste disposed of by material type for 1990 has been determined by each jurisdiction) is as follows:

- tabulate the tons/year disposed of by waste type and waste generator (residential, commercial, etc.) (Each jurisdiction must determine its waste disposal quantities.)
- tally these disposal quantities by waste type
- in a separate column, sum the quantity of waste diverted for each waste type (data provided by the County as a result of the EMCON waste diversion survey)
- add up the quantities disposed of and diverted to determine the total quantity in tons/year generated by waste type (disposed of + diverted = total generated)
- divide the quantity source reduced, recycled, and composted by the total waste generated to determine the diversion rate [(source reduction + recycling + composting x 100)/total quantity of solid waste generated = diversion rate percent]

ADDITIONAL RECYCLING COLLECTORS AND BROKERS THAT RESPONDED TO THE COUNTY OF SANTA CLARA RECYCLING SURVEY[1]

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

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

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

4. Diversified Recycling Services
   (Wood Chipper)
   1675 Pomona Avenue
   San Jose, California 95110
   (408) 294-1370

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

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

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

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

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

10. South Valley Refuse Disposal
    (Hauler)
    P.O. Box 515
    Gilroy, California 94021-0515
    (408) 842-3358

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

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

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

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[1] This list was developed based on referrals from recycling firms on the "Bay Area Recyclers" list (provided in this attachment). The type of business is indicated in parentheses, when available.

LANDFILLS AND TRANSFER STATIONS SURVEYED FOR THE COUNTY OF SANTA CLARA RECYCLING SURVEY[1]

1. All Purpose Landfill
2. Guadalupe Landfill
3. Pacheco Pass Landfill
4. Zanker Road Landfill
5. San Jose Recycling and Transfer Station
6. San Martin Transfer Station

[1] All were surveyed by phone and all responded.

Table A
Summary of Waste Diversion
Survey for Santa Clara County
(Tons Diverted, 1990)[1]

City	Residential[2] Diversion (tons)	Commercial[2] Diversion (tons)
Campbell	1,386	887
Cupertino	3,381	1,320
Gilroy	2,152	855
Los Altos	3,730	574
Los Altos Hills	4,241	70
Los Gatos	2,545	2,522
Milpitas	175	4,378
Monte Sereno	287	29
Morgan Hill	691	702
Mountain View	3,217	1,617
San Jose	37,916	370,658
Santa Clara	6,093	19,246
Saratoga	2,304	238
Sunnyvale	7,052	33,128
Unincorporated Area	272	2,223
Total[3]	88,332	444,259

1. Data represent a "best efforts" estimate, given the limitations of the surveys.

2. Does not include transformation.

3. Totals may vary due to rounding.

CITY OF MORGAN HILL

Table 1. RESIDENTIAL DIVERSION QUANTITIES
(Tons, 1990)

	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	0.0	0.0	112.8	0.0	0.0	0.0	112.8	0.0	112.8
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	0.0	0.0	112.8	0.0	0.0	0.0	112.8	0.0	112.8
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	0.0	0.0	7.0	0.0	7.9	0.0	14.9	0.0	14.9
HDPE containers	0.0	0.0	0.0	7.0	0.0	0.0	0.0	7.0	0.0	7.0
PET containers	0.0	0.0	0.0	0.0	0.0	7.9	0.0	7.9	0.0	7.9
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	0.0	0.0	300.0	0.0	56.6	0.0	356.6	0.0	356.6
refillable bev. containers	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0	0.0	100.0
CA Redemption Value	0.0	0.0	0.0	200.0	0.0	56.6	0.0	256.6	0.0	256.6
other recyclable glass	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	108.0	0.0	19.5	0.0	127.5	0.0	127.5
aluminum cans	0.0	0.0	0.0	69.0	0.0	19.5	0.0	88.5	0.0	88.5
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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
other ferrous	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	39.0	0.0	0.0	0.0	39.0	0.0	39.0
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
								0.0		0.0
OTHER ORGANICS	79.6	0.0	0.0	0.0	0.0	0.0	0.0	79.6	495.3	574.9
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	2.3	2.3
wood wastes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	493.0	493.0
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	79.6	0.0	0.0	0.0	0.0	0.0	0.0	79.6	0.0	79.6
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	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	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	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	0.0
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	79.6	0.0	0.0	527.8	0.0	84.0	0.0	691.4	495.3	1186.7

(a) Includes non-profit recycling activities.
(b) Considered Household Hazardous Wastes (HHW).

Table 2. COMMERCIAL/INDUSTRIAL DIVERSION QUANTITIES (Tons, 1990)

	SOURCE REDUCTION	CITY COMMERCIAL	PRIVATE COMMERCIAL	PRIVATE INDUSTRIAL	LANDFILL SALVAGING	COMPOSTING	TOTAL WITHOUT TRANSFORMATION	TRANS-FORMATION	TOTAL WITH TRANSFORMATION
PAPER	0.0	0.0	11.6	0.0	0.0	0.0	11.6	0.0	11.6
corrugated containers	0.0	0.0	3.2	0.0	0.0	0.0	3.2	0.0	3.2
newspaper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
high grade ledger paper	0.0	0.0	8.4	0.0	0.0	0.0	8.4	0.0	8.4
mixed paper	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
PLASTICS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	0.0	0.0	0.0	0.0
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	20.5	0.0	0.0	0.0	20.5	0.0	20.5
refillable bev. containers	0.0	0.0	3.5	0.0	0.0	0.0	3.5	0.0	3.5
CA Redemption Value	0.0	0.0	14.0	0.0	0.0	0.0	14.0	0.0	14.0
other recyclable glass	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	3.0
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	9.4	0.0	467.0	0.0	476.4	0.0	476.4
aluminum cans	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	8.8	0.0	0.0	0.0	8.8	0.0	8.8
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	0.6	0.0	0.0	0.0	0.6	0.0	0.6
white goods	0.0	0.0	0.0	0.0	467.0	0.0	467.0	0.0	467.0
YARD WASTE	0.0	0.0	80.0	0.0	0.0	0.0	80.0	0.0	80.0
OTHER ORGANICS	0.0	0.0	99.8	0.0	0.0	0.0	99.8	2.3	102.0
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	1.8	0.0	0.0	0.0	1.8	2.3	4.0
wood wastes	0.0	0.0	98.0	0.0	0.0	0.0	98.0	0.0	98.0
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	7.2	0.0	7.2	0.0	7.2
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	7.2	0.0	7.2	0.0	7.2
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	6.4	0.0	6.4	0.0	6.4
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	6.4	0.0	6.4	0.0	6.4
other special waste	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.0	221.3	0.0	480.6	0.0	701.9	2.3	704.1

(a) Considered Household Hazardous Wastes (HHW).

Appendix 4
FRANCHISE AGREEMENT

FRANCHISE AGREEMENT

THIS AGREEMENT entered into by and between the CITY OF MORGAN HILL, a Municipal Corporation (herein called "CITY") and SOUTH VALLEY REFUSE DISPOSAL, INC. a California Corporation (herein called "COMPANY"). The agreement shall be effective upon date of execution, but the terms and provisions shall become operative only upon presentation to the CITY of evidence by COMPANY that 60 additional acres of landfill site area has been purchased by said COMPANY and approved for future use by all appropriate regulatory agencies. It is further understood that this agreement shall supersede the previous agreement with COMPANY dated January 11, 1974.

R E C I T A L S

1. This contract is made pursuant to the provisions of Ordinance No. 674 N.S. which repeals the provisions of Ordinance No. 129 and Ordinance No. 207 and the provisions of said ordinance are incorporated into this contract and made a part thereof.

2. CITY regulates the collection and disposal of garbage, refuse and waste matter (herein referred to as "solid waste") to protect the physical health and safety of its inhabitants.

3. CITY has examined and found the performance and services provided by COMPANY to inhabitants of CITY under an agreement since November 1, 1951 to have been satisfactory.

4. The City Council of CITY hereby determines that the public interest and convenience, and the physical health and safety of its inhabitants require the entering into of the within Franchise Agreement.

5. CITY and COMPANY desire to enter into a new Franchise Agreement providing continuation to COMPANY for the collection and disposal of solid waste matter accumulated in CITY.

A G R E E M E N T

In consideration of the mutual covenants, terms and conditions herein contained, the parties agree as follows:

1. Franchise Grant.

CITY grants to COMPANY, and COMPANY hereby accepts from CITY the exclusive right, franchise and privilege to collect and dispose of all solid waste matter produced, kept or accumulated in the City of Morgan Hill, together with the right and privilege to use and operate upon the CITY maintained streets and other rights-of-way to the extent necessary to perform COMPANY's obligations under this Franchise Agreement.

The right and privilege herein granted shall be subject to compliance with the provisions of CITY's ordinances pertaining to the accumulation, collection and removal of solid waste matter as they presently exist or as they may be amended during the term hereof, or any extension thereof, and any applicable State and Federal statutory or administrative laws and rules. For the purposes of this Agreement "solid waste matter" is defined to mean all putrescible and nonputrescible solid, semi-solid and liquid wastes.

2. Franchise Term and Renewal

(A) The term of the Franchise shall be for a period of Twenty (20) years, commencing at 12:01 a.m. on the 1st day of January, 1988, and ending at 11:59 p.m. on the 31st day of December, 2008, excepting as herein otherwise specified.

(B) During the third, tenth and fifteenth years, respectively, of the term of this Agreement, an audit of the performance of COMPANY (herein called the "Performance Audit" shall be conducted as set forth in Subsection (C) of Section 2.

(i) If after the City Council of CITY has reviewed a particular Peformance Audit and has considered any evidence presented by COMPANY in connection therewith, the Council determines to its satisfaction that all covenants, provisions, terms and conditions of this Agreement on the part of COMPANY to be performed, kept and observed, have not been fully and faithfully performed, kept and observed, then this Agreement may be terminated by CITY at its option and without prejudice to any other remedy to which it may be entitled to either at law, in equity, or under this Agreement by giving written notice of termination either by mail or personal service, to COMPANY not less than thirty (30) days prior to the date upon which the termination is to become effective. This right of termination shall be in addition to the right of CITY to terminate this Agreement under the provisions of Section 20 hereof.

(ii) In connection with the review of a particular Performance Audit, CITY reserves the right to propose any amendment or amendments of this Agreement which the City Council of CITY determines to be necessary by reason of the findings or results of the Performance Audit to carry out the intent of the terms and conditions of this Agreement.

(C) The performance audit shall:

(i) be performed by a qualified firm to be selected by CITY.

(ii) be totally paid for by COMPANY as part of its operating costs, and

(iii) address all appropriate areas including, but not limited to the following areas, and shall provide specific recommendations for improvement in each area, namely:

(a) Overall organizational structure and management systems and procedures.

(b) Efficiency of collection operations, including any analysis of routes, schedules and the impact of franchise requirements.

(c) Staffing practices, including the deployment of management and supervisory personnel.

(d) Financial management practices, including the COMPANY's billing and collection system and its policies with regard uncollected accounts.

(e) Personnel management practices, including compensation policies and the resolution of employee grievances.

(f) Procedures for receiving and resolving customer complaints and concerns, including damage to customer-owned containers and disappearance of container covers.

(g) Procedures for the acquisition, maintenance and replacement of equipment; types of equipment; rationale for recent capital investments; and financing options.

(h) Utilization and management of facilities.

3. Franchise Fee - City to remit on Collections rather than Billings.

City shall be paid and retain 10%, or one-tenth of all commercial and residential fees for solid waste collections collected by the CITY through its billing service to COMPANY and shall pay the balance to COMPANY for its services and duties undertaken by this Contract.

On commercial and residental accounts renting bins from COMPANY, CITY shall bill the bin rental fee at no charge to the COMPANY and shall remit the bin rental fee to the COMPANY without deduction of the ten (10%) percent charge of the CITY.

The CITY hereby guarantees billing of all persons within the City of Morgan Hill which are known to CITY to be receiving the service of the COMPANY, and CITY shall pay over to COMPANY at least once a month by the 10th day of each month, for services rendered during the prior month, the amount of all collections made by the CITY, but less ten (10%) percent of the total amount collected for residential and commercial solid waste collections, which shall be retained by the CITY for services rendered to the COMPANY by the CITY, and shall also constitute the entire fee due CITY under this contract.

It is mutually understood and agreed, by and between the CITY and COMPANY, that the guarantee herein made by the CITY to the COMPANY, pertains only to billings to persons (1) residing within the City of Morgan Hill (2) known to CITY, (3) and known to the City to be receiving services of the COMPANY, (4) when neither CITY nor COMPANY has been notified to discontinue services and pertains to remittances to COMPANY by CITY on basis of collections, not billings, on both residential and commercial accounts.

COMPANY shall have access to CITY records of garbage customers and collections.

4. Franchise Services.

(A) COMPANY shall furnish the personnel, labor and equipment required for the collection, removal, handling and disposal of all solid waste matter generated within the corporate limits of the City of Morgan Hill in accordance with the terms set forth in this Agreement.

(B) COMPANY also agrees, as a part of the consideration for the awarding to it of the right, franchise and privilege for collecting garbage in the City of Morgan Hill, to collect for CITY, without any charge, refuse from all CITY premises, buildings and installations, including but not limited to the City Parks, City garbage cans, if any, along City streets, municipal buildings, and the City Hall building.

(C) Collection of solid waste matter shall be at the curbside of the customer's property unless arrangements are made with COMPANY by the customer for a sideyard pickup and payment of the additional rate for sideyard pickups.

(D) COMPANY may provide additional services upon request of CITY subject to the establishment of a rate therefor. Provided, however, if COMPANY elects not to provide a proposed new service and so notifies CITY in writing, CITY retains the right to perform the proposed new service itself or to contract with another business entity to provide it.

(E) COMPANY shall provide unlimited pickup service for residences and there shall be no charge for solid waste hauling for the CITY sponsored once a year Spring Clean Up Day.

(F) COMPANY shall provide regular, scheduled collection service on a city-wide basis in all residential areas at least once per week, or oftener, as arranged for by the customer and within all non-residential areas in accordance with the frequency of pickup specified for the particular service in the Schedule of Rates.

(G) COMPANY shall not alter or adjust collection schedules or routes without providing prior notice to all service addresses, and any schedule modification shall not result in reduced service frequency to any customer. COMPANY shall collect and remove from any and all premises, within twenty-four (24) hours after demand, notice or request, any and all solid waste matter which COMPANY shall have failed to collect and remove as required at the regular scheduled time.

(H) CITY and COMPANY shall mutually agree upon the routes, days and hours for the collection of solid waste matter.

(I) COMPANY shall comply with each of the following requirements:

(i) All collection vehicles and equipment shall be modern and so constructed and maintained to prevent leakage, spillage and overflow. COMPANY shall maintain all vehicles, detachable containers and debris boxes in a clean and sanitary condition, and shall perform such maintenance necessary to assure each vehicle and piece of equipment capable of performing all functions for which it was designed. COMPANY shall maintain an equipment replacement schedule to be provided to CITY upon its request.

(a) All trucks and equipment shall be clearly identified with COMPANY name, a current local business telephone number, and a vehicle identification number in letters not less than two and one-half (2-1/2) inches in height.

(b) CITY may refuse to permit the operation within the City limits of any vehicle not adequately serviced, cleaned or in need of repair. Removal of vehicles for servicing and repair shall not relieve the COMPANY from maintaining all collection schedules.

(ii) COMPANY shall not litter premises in the process of making collections nor allow refuse to blow or fall from any vehicles used for collections. COMPANY shall replace lids or covers on containers immediately after emptying the same and shall repair or replace at its expense any containers damaged as a result of its handling thereof, normal wear and tear excepted. COMPANY shall clean up all spills including oil and debris on the streets resulting from its operation.

(iii) COMPANY shall establish and maintain an office where complaints may be made. Such office shall have a responsible individual available daily between the hours of eight o'clock a.m. and five o'clock p.m., excepting Saturday, Sunday and such holidays as are recognized by COMPANY and approved by CITY. Calls for missed garbage shall be received twenty-four (24) hours per day.

(iv) CITY agrees to require all customers to place their garbage, refuse and rubbish in metal or plastic side containers with tight lids therefore. No container shall exceed 32 gallons in size and shall not exceed 70 pounds in weight when full, and COMPANY shall not be required to pick up materials that are not placed in containers as above specified. As an exception to the above requirements, cardboard in tied bundles not exceeding three (3) feet in length and tree and shrubbery prunings, securely tied, and not exceeding three (3) feet in length and thirty (30) pounds in weight will be picked up at street curb.

(iiv) COMPANY shall replace all garbage and rubbish containers used by its customers in an upright position, recovered, in approximately the same location where the containers were immediately before COMPANY emptied them. COMPANY shall return all commercial bins to the location where the containers were immediately before COMPANY emptied them, within any enclosures provided and shall close any doors or gates provided for screening the bins. COMPANY shall instruct its employees to comply with the foregoing requirements, and shall exercise sufficient supervision of its employees to assure that these instructions are followed.

5. Franchise Representative and Inspections

(A) COMPANY shall assign a qualified person to be in charge of its operations in the CITY, and shall inform CITY of such person's identity and experience. It shall be such person's responsibility to assure that all collection operations are effectively performed and all complaints courteously handled and satisfactorily resolved.

(B) To ensure that the laws governing the performance of this Agreement are complied with, a representative of CITY may inspect, review and observe the operations of COMPANY during the term of this Agreement. CITY may make inspections upon reasonable notice. At CITY's request, COMPANY shall make designated personnel avaiable to accompany CITY inspectors.

6. Franchise Collection Rates

(A) COMPANY shall not charge any amount in excess of the approved schedule of service rates for any services required or permitted to be performed by the terms of this Agreement, including, but not limited to residential, non-residential, drop-off boxes (inclusive of rental fees) and special pickup services. The approved service rates are those set forth in Exhibit "A" attached hereto and incorporated herein by reference, or as such Schedule of Rates may hereafter be amended by resolution of the City Council.

(B) COMPANY shall submit its request for a review of service rates no later than two (2) months prior to the proposed effective date of any rate adjustments. Each of the following items shall be provided by COMPANY as part of its request for a rate review at no expense to CITY and in the manner and form presecribed by CITY.

(i) An audit for the fiscal year immediately preceeding the year in which the rate review is requested, and prepared by a certified public accountant who has annexed his opinion thereto.

(ii) Financial reports and operating data to review for the two (2) fiscal years immediately preceeding the fiscal year for which an audit is required.

(iii) Actual revenues for the current fiscal year and projected revenues for the ensuring year.

(iv) Organization chart reflecting current staffing, job description and salary schedules.

(v) A survey of collection rates of certain other disposal companies to be agreed upon by CITY and COMPANY.

(vi) COMPANY's equipment replacement schedule.

(vii) Detail concerning the current service rates, actual costs for services, and actual revenues for the previous year, together with the projected revenues, expenditures and proposed rates for the ensuing year for all service categories including:

(a) Residential Service.

(b) Hard to serve areas.

1) Provide maps and/or lists delineating hard to serve areas, together with rate proposals to be considered for such area. A map of any hard to serve area for which rate proposals are approved shall be attached to any schedule of service rates thereafter.

2) A "hard to serve area" is defined as an area of one or more residences or non-residential establishements which, by virtue of the nature of its access road or the low density of individual residents, requires significant additional time or effort, or use of special equipment to pick up solid waste matter.

(c) Non-Residential areas.

1) Costs of service in such areas shall be reflected by the size of bin and frequency of collection.

2) Costs of drop-off boxes shall be reflected by the size of the box, and will include rental fees as well as the cost per dump.

(C) Upon receipt of the Council Subcommittee's recommendation, the City Council of CITY shall determine whether to approve any change in the previously approved Schedule of Rates.

(i) In reaching its decision, the City Council shall determine what are the proper expenses to be used in the calculation of a rate base for a rate increase after COMPANY has been given an opportunity to provide documentation to CITY's administrative staff and the City Council.

(D) In the event CITY requests COMPANY to provide any additional new services, COMPANY shall furnish CITY with documentation concerning the costs of the new service, and the City Council shall establish a rate for the new service.

7) <u>Company Providing Criteria to Review Development Plans.</u>

COMPANY shall provide CITY with the specific criteria by which development plans for residential and non-residential units may be reviewed by CITY

concerning the location of refuse containers and appropriate screening thereof.

8. Franchise Service Termination.

COMPANY may terminate service to residential customers who are one hundred twenty (120) days in arrears in payment of rate charges and non-residential customers who are sixty (60) days in arrears in payment of rate charges, respectively, provided COMPANY:

(A) Shall give a customer whose service may be cut off at least (30) days written notice prior to the proposed service termination date.

(B) Shall notify CITY in advance of each proposed service termination by property location.

(C) Shall monitor each property location at which service has been terminated and notify CITY of any problems observed, including accumulation of garbage on the premises.

(D) Shall promptly restore service when the rate charges owing have been paid. Provided, however, CITY reserves the right and discretion unilaterally to withdraw COMPANY's privilege of terminating service for non-payment of rate charges by giving COMPANY at least (30) days written notice prior to the suspension of this privilege and holding one (1) meeting with COMPANY concerning withdrawal of the privilege. No amendment of this Agreement shall be required. If this privilege is withdrawn, COMPANY shall be entitled to do each of the following:

(i) Include bad debt as part of its rate base, but limited to one (1) percent of its annual gross revenues; provided, however, if COMPANY demonstrates a good faith effort in its attempts to collect bad debts to the satisfaction of CITY, then CITY may allow inclusion of bad debts as part of the rate base in a specified amount beyond one (1) percent of annual gross revenue; and

(ii) Require a deposit for new customers and for re-starts of service.

9. Franchise Insolvency or Bankruptcy

If the COMPANY shall at any time during the term of this Agreement or any extension thereof, become insolvent, or if proceedings in bankruptcy shall be instituted by or against COMPANY, or if COMPANY shall be adjudged bankrupt or insolvent by any Court, or if a receiver or trustee in bankruptcy or a receiver of any property of COMPANY shall be appointed in any suit or proceeding brought by or against the COMPANY, or if COMPANY shall make an assignment for the benefit of creditors, then and in each and every such case, this Agreement shall immediately cease and come to an end, and the rights and privileges granted in this Agreement shall immediately be cancelled and annulled without notice or action required on behalf of CITY.

10. Franchise Disaster Assistance

(A) In the event of wartime, natural, physical or other disaster in or proximate to the CITY limits resulting in the declaration of a State of Emergency by the duly authorized authority or City Council, COMPANY shall make available to CITY at no cost to CITY, all trucks, equipment and personnel normally performing services under this Agreement, for emergency operations conducted or directed by the CITY emergency organization.

(B) CITY shall have the right to take possession of all such equipment provided by COMPANY, and to temporarily employ all COMPANY personnel so provided as emergency operation forces of CITY, under the direction and control of the CITY disaster operation chief.

(C) COMPANY shall make available, in addition to the equipment and personnel above, equipment and personnel from those COMPANY operations and resources not serving CITY, to the extent necessary to conduct effective refuse, waste and debris removal during any declared State of Emergency to the specifications of the Disaster Operations Chief.

(D) CITY shall not be required to compensate COMPANY in any manner or form for COMPANY provision of vehicles, personnel or equipment normally performing services under this Agreement within the CITY limits, when made available during a declared State of Emergency. When additional vehicles, personnel or equipment are provided during an emergency, CITY shall compensate COMPANY for actual expenses incurred by COMPANY in providing additional vehicles, upon submission by COMPANY to CITY of detailed records of costs and expenses actually borne by COMPANY, and upon approval by the Federal government of CITY's reimbursement of expenses incurred by COMPANY during a disaster.

11. Franchise Indemnification

COMPANY shall protect and save harmless CITY, its officers, agents and employees, for and from any and all loss, liability, claims, demands, actions or suits, of any and every kind and description, arising or resulting from or in any way connected with any operations of COMPANY or its subcontractors in exercising any license or privilege granted to him by this Agreement or by any ordinance of CITY, or arising or resulting from the failure of COMPANY or its subcontractors to comply in all respects with the provisions and requirements of this Agreement, or of all applicable ordinance of CITY and of all other applicable laws. COMPANY shall, upon demand of CITY, at COMPANY's sole cost and expense, defend, and provide attorneys to defend CITY, its officers, agents and employees against any and all claims, actions or suits brought against CITY its officers, agents and employees, arising or resulting from or in any way connected with the above-mentioned operations of COMPANY or its subcontractors or its subcontractor's failure to comply with this Agreement and with the ordinances and laws hereinabove mentioned.

12. Franchise Insurance and Bond.

(A) This Agreement and the privileges herein granted to COMPANY is and are conditioned upon the faithful performance by COMPANY and by each and every one of his subcontractors, if any, of each and all of the covenants and provisions herein agreed to be performed by COMPANY or required to be performed by its subcontractors; and payment of all license fees and other monies herein agreed to be paid by COMPANY.

(B) Upon execution of this Agreement, COMPANY shall furnish to CITY and shall file with the City Clerk of CITY a corporate surety bond, approved by the Chief Administrative Officer and approved as to form by the City Attorney executed by COMPANY as principal and by a corporate surety as surety, in the sum of $100,000.00 (One Hundred Thousand Dollars), conditioned upon the faithful performance by COMPANY and its subcontractors, if any, of this Agreement.

(C) COMPANY agrees to carry, during the life of this Agreement, public liability and property damage insurance in the limits of $1,000,000 and $1,000,000 respectively, with both types of insurance protecting CITY as well as COMPANY, and COMPANY further agrees to hold CITY harmless from any damage or claims for damage arising out of the operations of COMPANY in carrying out the provisions of this Agreement or because of non-performance by it of any obligation placed upon it by this Agreement.

13. Franchise Agreement

COMPANY shall not assign this Agreement or any interest therein, or any privilege or right granted therein, without the written consent of the City Council being first obtained, and then only to a person or persons approved by said Council subject to such terms and conditions as said Council may require.

CITY may review the competency and financial integrity of the proposed assignee. The authorization will not be unreasonably withheld by CITY. A consent to one assignment shall not be deemed to be a consent to any subsequent assignment. Any assignment without such consent and approval shall be void and shall at the option of CITY, terminate this Agreement and the rights and privileges granted herein. This Agreement shall not, nor shall any interest therein, be assignable, as to the interests of COMPANY, by operation of law without the written consent of said Council expressed by ordinance or resolution. COMPANY shall not subcontract all or any portion of the work or business of this Agreement without the written consent of CITY.

14. Franchise Waste

Notwithstanding any other provision of this Agreement, CITY shall retain ownership of waste prior to its disposal by COMPANY in the designated landfill.

15. Franchise Waiver

The waiver by CITY of any breach or violation of any term, covenant or condition of this Agreement or of any provision, ordinance or law shall not be deemed to be a waiver of such term, convenant, condition, ordinance or law, or of any subsequent breach or violation of the same or of any other term, covenant, condition, ordinance or law. The subsequent acceptance by CITY of any franchise or other fee or of any other monies which may become due hereunder to CITY shall not be deemed to be a waiver of any preceding breach of violation by COMPANY of any term, covenant or condition of this Agreement or of any applicable law or ordinance.

16. Franchise Administration

The administration and enforcement of this Agreement shall be the responsibility of the City Manager or designated representatives of that office.

17. Franchise Independent Contractor Status

COMPANY, its employees and agents, are independent contractors and not employees, agents or sub-agents of CITY.

18. Franchise Notice

Any notice required to be given to COMPANY shall be deemed to be duly and properly given if mailed to COMPANY, postage prepaid, addressed to:

SOUTH VALLEY REFUSE DISPOSAL, INC.,
P.O. Box 515
Gilroy, CA 95020

19. Franchise Labor Disputes

In the event the employees of COMPANY go on strike during any time this contract is in force, and COMPANY is unable to find suitable replacements to operate its trucks and provide the services it has agreed upon herein, CITY shall have the option of furnishing CITY employees to replace those on strike. During any such emergency, COMPANY agrees to continue management of the business and to pay CITY employees a wage comparable to that of the person such employee is replacing. COMPANY shall make its trucks, equipment and disposal site available to CITY so as not to interrupt the services agreed upon herein. CITY shall continue to guarantee payment of fees to COMPANY during such period; provided, however, that if CITY's duties become more onerous, the parties will adjust their compensation. COMPANY shall not be financialy liable to CITY for any inconvenience or damage resulting to CITY

by reason of any disruption of service occasioned by strike by COMPANY employees.

20. Franchise Termination

Should COMPANY fail, refuse or neglect to provide satisfactory service or equipment in the making of the garbage and refuse collections provided for in this Agreement, City may, at its option, terminate this Agreement after giving 30 days notice.

21. Company Ownership of Waste and Recycling Efforts

All rights, legal title, and interest in and to all solid waste from all sources within the service area shall be passed to COMPANY upon deposit of the waste in the landfill site. COMPANY will utilize their best efforts to implement and maintain waste recovery or recycling programs. COMPANY shall have the first right and option and right of first refusal for the recycling of any type of material in COMPANY's service area. However, if COMPANY chooses not to recycle a type of material which CITY deems recyclable, CITY may, at its option, cause or implement independent recycling programs to handle said waste.

IN WITNESS WHEREOF, said CITY has caused its name to be signed to this Agreement by its Manager, duly authorized to sign this Agreement by motion of the City Council, and said COMPANY has signed its name hereto.

CITY OF MORGAN HILL, a Municipal Corporation
of the State of California

DATE: June 4 1984

Charles R. Cate

Charles R. Cate, City Manager

SOUTH VALLEY REFUSE DISPOSAL, INC.
A California Corporation

DATE: June 6, 1984

FIRST AMENDMENT TO FRANCHISE AGREEMENT

This Amendment dated 7 February, 1990 is entered into by and between the CITY OF MORGAN HILL, a municipal corporation ("CITY") and SOUTH VALLEY REFUSE DISPOSAL, INC., a California corporation ("COMPANY"). This first amendment amends the Franchise Agreement entered into between the parties and executed in June of 1984. Paragraph 3 of the Franchise Agreement is amended to read as follows:

3. Franchise Fee - City to remit on Collections rather than Billings.

City shall be paid and retain ten percent (10%), or one-tenth of all commercial and residential fees for solid waste collections collected by the CITY through its billing service to COMPANY and shall pay the balance to COMPANY for its services and duties undertaken by this Contract.

The CITY hereby guarantees billing of all persons within the City of Morgan Hill which are known to CITY to be receiving the service of the COMPANY, and CITY shall pay over to COMPANY at least once a month by the 10th day of each month, for services rendered during the prior month, the amount of all collections made by the CITY, but less ten percent (10%) of the total amount collected for residential and commercial solid waste collections, which shall be retained by the CITY for services rendered to the COMPANY by the CITY, and shall also constitute the entire fee due

CITY under this contract.

It is mutually understood and agreed, by and between the CITY and COMPANY, that the guarantee herein made by the CITY to the COMPANY, pertains only to billings to persons (1) residing within the City of Morgan Hill (2) known to CITY, (3) and known to the City to be receiving services of the COMPANY, (4) when neither CITY nor COMPANY has been notified to discontinue services and pertains to remittances to COMPANY by CITY on basis of collections, not billings, on both residential and commercial accounts.

COMPANY shall have access to CITY records of garbage customers and collections.

In all other effects, the Franchise Agreement executed in June of 1984 other than as amended by this First Amendment shall continue to remain in effect.

CITY OF MORGAN HILL, a Municipal Corporation of the State of California

DATE: 2-27- 1990.

ARTHUR COLLEGE,
Assistant City Manager

SOUTH VALLEY REFUSE DISPOSAL, INC.
A California Corporation

DATE: 2-23-90 1990.

RICHARD LUCHETTI
President

AMEND1

SECOND AMENDMENT TO FRANCHISE AGREEMENT

This Amendment dated 20 February, 1991 is entered into by and between the CITY OF MORGAN HILL, a Municipal Corporation ("CITY") and SOUTH VALLEY REFUSE DISPOSAL, INC., a California Corporation ("COMPANY"). This Second Amendment amends the Franchise Agreement entered into between the parties and executed in June of 1984 and amended in February, 1990. The paragraph below is added to the Recitals at the beginning of the Franchise Agreement.

R E C I T A L S

6. CITY is subject to the provisions of the Integrated Solid Waste Management Act (AB939) which requires cities to develop solid waste management plans and authorizes the imposition of fees to pay for this mandate.

Paragraph 3 of the Franchise Agreement is amended to read as follows:

3. Franchise Fee - City to remit on Collections rather than Billings.

City shall be paid and retain twelve and one-half percent (12.5%) of all commercial and residential fees for solid waste collections collected by the CITY through its billing service to COMPANY and shall pay the balance to COMPANY for its services and duties undertaken by this Contract.

The CITY hereby guarantees billing of all persons within the City of Morgan Hill which are known to CITY to be receiving the service of the COMPANY, and CITY shall pay over to COMPANY at least once a month by the 10th day of each month, for services rendered during the prior month, the amount of all collections made by the CITY, but less twelve and one-half (12.5%) of the total amount collected for residential and commercial solid waste collections, ten percent (10%) of which shall be retained by the CITY for services rendered to the COMPANY by the CITY, and the remaining two and one-half percent (2.5%) of which shall be retained by CITY to pay for mandated solid waste management services provided by CITY, and shall also constitute the entire fee due CITY under this contract.

It is mutually understood and agreed, by and between the CITY and COMPANY, that the guarantee herein made by the CITY to the COMPANY, pertains only to billings to persons (1) residing within the CITY of Morgan Hill (2) known to CITY, (3) and known to the City to be receiving services of the COMPANY, (4) when neither CITY nor COMPANY has been notified to discontinue services and pertains

to remittances to COMPANY by CITY on basis of collections, not billings, on both residential and commercial accounts.

COMPANY shall have access to CITY records of garbage customers and collections.

In all other effects, the Franchise Agreement executed in June of 1984 **and amended in February 1990** other than as amended by this Second Amendment shall continue to remain in effect.

CITY OF MORGAN HILL, a Municipal Corporation of the State of California

DATE: 3-8-91

By: Jan C. Perkins
Jan C. Perkins, City Manager

SOUTH VALLEY REFUSE DISPOSAL, INC., a California Corporation

DATE: 3-7-91

By: Richard Luchetti
Richard Luchetti, President

agenda/amendref.use

Third Amendment to Franchise Agreement
(Residential Curbside Recycling)

This Amendment dated June 17, 1992 is entered into by and between the CITY OF MORGAN HILL, a Municipal Corporation ("CITY") and SOUTH VALLEY REFUSE DISPOSAL COMPANY, INC., a California Corporation ("COMPANY"). This Third Amendment amends the Franchise Agreement entered into by the parties in June of 1984, as previously amended in February, 1990 and February, 1991.

Recitals

WHEREAS, in its effort to achieve the waste reduction goals of the California Integrated Waste Management Act of 1989 (AB 939), the City Council of Morgan Hill has approved the implementation of residential curbside recycling program; and

WHEREAS, South Valley Refuse Disposal Company, Inc. represents that it has the necessary resources, skills and expertise to provide a residential curbside recycling program;

NOW THEREFORE, CITY and COMPANY agree as follows:

I. TERM OF AGREEMENT

This Amendment effecting a residential curbside recycling program shall be for a period of ten (10) years. An audit of the performance of the COMPANY pursuant to this Amendment shall be conducted every two (2) years by the CITY. The CITY shall have the ability to amend or terminate this Amendment if results of the performance audit indicate unsatisfactory performance by the COMPANY which is not cured within thirty (30) days of written notice of the deficiency.

II. SERVICES PROVIDED

1. COLLECTION SERVICE

COMPANY shall provide equipment, vehicles, personnel and supervision for curbside collection of recyclable materials to all single-family units and multi-family units receiving residential refuse collection and disposal service in Morgan Hill. Provision of this service will commence one hundred and ten (110) days after the approval of this Amendment.

2. MATERIALS COLLECTED

COMPANY shall collect all recyclable materials placed in appropriate

recycling containers including:

a. Newspaper - tied with string or placed in paper grocery bags.
b. Metal Cans - aluminum and ferrous cans placed in a COMPANY-provided container.
c. Glass Jars and Bottles - clear and colored containers placed in a COMPANY-provided container.
d. Plastic Containers - all PET (polyethylene terephthalate) and HDPE (high density polyethylene) containers placed in a COMPANY-provided container.
e. Used Motor Oil - only if placed in a COMPANY-provided, sealed, oil container.
f. Other Items - items mutually acceptable to the COMPANY and CITY including, but not limited to telephone books, Christmas trees.

The COMPANY shall not be required to collect, and may leave on the curbside, any load which is contaminated by or mixed with hazardous waste or non-recyclable materials. COMPANY shall leave notice with the load explaining why it was not collected.

3. RECYCLING CONTAINERS

COMPANY shall provide residents with appropriate recycling containers reasonably acceptable to CITY for the collection of recyclable materials. At all times the containers shall be the property of the COMPANY. COMPANY shall make a reasonable effort to maintain or replace damaged or lost recycling containers.

4. COLLECTION SCHEDULE

Collection shall be performed on a biweekly (once every two weeks) basis and will occur on the same day as regular refuse collection service. The holiday collection schedule shall be the same as that for regular refuse collection service.

5. SERVICE AREA MAP

COMPANY shall provide CITY with a map delineating service areas for each day of the week collection service is provided.

6. TRANSPORTATION OF MATERIALS

COMPANY shall be responsible for transporting recyclable materials to a processing facility.

7. PROCESSING SERVICE

COMPANY will make reasonable efforts to ensure that all economically recyclable materials are processed and sold and are not disposed of in landfills. COMPANY and CITY will mutually agree upon the final disposition of recyclable materials that are not economically feasible to market prior to disposal.

8. CUSTOMER SERVICE

COMPANY shall satisfactorily provide comprehensive customer service for this residential curbside recycling program, including but not limited to responding to complaints, answering questions and handling missed pick-ups. Missed pick-ups shall be collected within twenty-four (24) hours of being reported. A record of customer complaints and disposition shall be maintained by COMPANY and made available to CITY at CITY's request.

9. PUBLIC AWARENESS/EDUCATION PROGRAM

COMPANY shall provide, at CITY's request, reasonable assistance in conducting the public awareness/education program. Such assistance may include, but is not limited to: 1) providing assistance in developing educational and promotional programs and materials; 2) distributing educational and promotional materials; and 3) providing recycling vehicle(s) and personnel for appearances at special events such as parades, fairs, etc.

III. REPORTS

1. Within thirty (30) days after the end of each month, COMPANY shall submit to CITY written monthly reports, in a format reasonably acceptable to the CITY, that provide the following information:

   a. Collected Tonnages - a monthly summary of the quantity, by weight, of each recyclable material collected.

   b. Participation Rates - a monthly reasonably estimated summary of the total number of households served per route, the actual number of households participating, the number of pickups per route, and the percentage of pickups by route.

   c. Recycling Revenues - a monthly summary of the total dollar amount received for each category of recyclable materials sold.

2. COMPANY shall provide an annual report summarizing total expenses

incurred for this program. This shall include personnel expenses with dollar value of fringe benefits paid, equipment expenses, operational, administrative and miscellaneous costs. This annual report shall be submitted by each July 31st, covering the year ended June 30th.

IV. ADDITIONAL SERVICES/EXPANSION OF SERVICES

If CITY requests COMPANY to perform additional services not contemplated by this Amendment, written authorization for such services and compensation therefore shall be agreed upon and signed by CITY and COMPANY prior to the performance of such services.

V. COMPENSATION

1. The COMPANY is authorized to receive compensation for provision of residential curbside recycling services and such compensations shall be incorporated into the monthly rate charged to residential solid waste customers.

2. The COMPANY may request review of the residential recycling service rate in accordance with the provisions of Section 6 of the Franchise Agreement which may be adjusted annually to reflect changes in the cost of providing service.

3. The CITY shall compensate COMPANY directly by payment or indirectly by increasing the residential collection rate allowed COMPANY for all costs reasonably incurred by COMPANY in the recycling program to comply with changes in federal, state or local laws or regulations.

VI. ADMINISTRATIVE PROVISIONS

1. COMPLIANCE WITH LAWS AND REGULATIONS

COMPANY warrants that it will comply with all applicable laws, including implementing regulations, as they may be amended from time to time, including, but not limited to, the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA") 42 U.S.C. Sections 9601 et seq., the Resource Conservation and Recovery Act, 42 U.S.C. Sections 6901, et seq., the California Integrated Waste Management Act of 1989, and all other applicable laws of the United States of America, the State of California, the County of Santa Clara, ordinances of the City, the requirements of Local Enforcement Agencies and other agencies with jurisdiction.

2. OWNERSHIP OF RECYCLABLE MATERIALS

Ownership and the right to possession of recyclables placed in containers or bins or bundles for collection, or placed at curbside, shall transfer directly from the residential customer to COMPANY when such materials are placed in the COMPANY's truck, as provided herein. COMPANY's arrangements with its customers will provide that, subject to the right of the customers to claim lost property, title and the right to possession, and liability for all recyclables which are set out for collection on the regularly scheduled collection day shall pass to COMPANY at the time they are placed in the COMPANY's truck. The COMPANY shall have the right to retain any benefit or profit resulting from its right to retain, recycle, compost, dispose of or use the recyclables which it collects. At no time does the CITY obtain any right of ownership or possession of recyclables placed for collection, and nothing in this Amendment shall be construed as giving rise to any inference that CITY has any such rights.

3. INDEPENDENT CONTRACTOR

It is agreed that COMPANY is an independent contractor, and all persons working for or under the direction of the COMPANY are the COMPANY's agents, servants, employees, and said persons shall not be deemed agents, servants or employees of CITY.

4. INDEMNIFICATION

a. Indemnification of CITY. COMPANY agrees that it shall protect, defend with counsel reasonably acceptable to CITY, indemnify and hold harmless CITY, its officers, employees, and agents from and against any and all losses, liabilities, fines, penalties, claims, damages, liabilities or judgements, including attorney's fees, arising out of or resulting in any way from CITY's grant of this franchise to COMPANY or COMPANY's exercise of the franchise, unless such claim is due to the negligence or willful acts of the CITY, its officers, employees, agents, contractors or volunteers. Upon demand of the CITY, made by and through the City Attorney, COMPANY shall appear in and defend the CITY and its officers, employees, and agents in any claims or actions, whether judicial, administrative or otherwise which are within the scope of the foregoing indemnity.

b. Household Hazardous Substance Indemnification. COMPANY shall indemnify, defend with counsel reasonably acceptable to CITY, protect and hold harmless CITY, its officers, employees, agents, volunteers, assigns and any successor or successors to CITY's interest from and

against all claims, actual damages (including special and consequential damages but excluding punitive damages), natural resources damage, injuries, cost, response, remediation and removal costs, losses, liabilities, causes of action, suits, legal or administrative proceedings, interest, and expenses (including but not limited to attorneys' and expert witness fees and costs incurred in connection with defending against any of the foregoing or in enforcing this indemnity) of any kind whatsoever paid, incurred or suffered by, or asserted against, City or its officers, employees, or agents arising from or attributable to any repair, cleanup or detoxification, or preparation and implementation of any removal, remedial, response, closure or other plan (regardless of whether undertaken due to governmental action) concerning any Hazardous Substance or hazardous wastes at any place where COMPANY processes or stores material for recycling pursuant to this Third Amendment. The foregoing indemnity is intended to operate as an agreement pursuant to Section 107(e) of the Comprehensive Environmental Response, Compensation and Liability Act, "CERCLA", 42 U.S.C. Section 9607(e), and California Health and Safety Code Section 25364, to defend, protect, hold harmless and indemnify CITY from liability.

c. AB 939 Indemnification. COMPANY agrees to protect, defend, with counsel reasonably acceptable to CITY, and indemnify CITY against fines or penalties imposed by the California Integrated Waste Management Board in the event that the CITY fails to meet its AB 939 waste reduction goals due to the COMPANY's failure to satisfactorily fulfil its obligations pursuant to this Amendment.

5. INSURANCE

COMPANY will obtain, maintain and submit reasonable evidence to CITY of, during the period in which residential curbside recycling services are provided, insurance as follows:

a. Workers Compensation, covering all employees of COMPANY, that meets all requirements of the California Labor Code.

b. Comprehensive General Liability with limits of $1,000,000 for bodily injury and property (combined single limit), written on an occurrence basis.

c. Motor Vehicle Insurance with limits for bodily injury and property damage of $1,000,000 (combined single limit).

Such evidence shall be in the form of an ACORD form Certificate of Insurance and original endorsements to policies each naming the CITY and its officers, employees and agents as additional insureds on all policies. In the event of cancellation of any coverage, thirty (30) days prior written notice of termination shall be given to the CITY. Notice shall be sent to:

City Manger
City of Morgan Hill
17555 Peak Avenue
Morgan Hill, California 95037

6. PERFORMANCE BOND

The provisions of Section 12(a) of the Franchise Agreement are incorporated in this Amendment by this reference. No increase in the amount of the existing performance bond is required, provided that such bond is reissued or amended to cover COMPANY's performance under this Amendment. The revised or amended performance bond shall be filed with the CITY prior to the commencement of recycling services.

7. AMENDMENT

This Amendment may be amended by mutual agreement of the parties. Such amendments shall be in writing and signed by both parties.

8. SERVICE EXCEPTION; HAZARDOUS WASTE NOTIFICATIONS

When recyclables are not collected from any residential customer for any reason including the presence or suspected presence of hazardous waste or contaminants, COMPANY shall notify its customer in writing why the collection was not made. COMPANY has represented to CITY that COMPANY will carry out its duties to notify all agencies with jurisdiction, including the California Department of Toxic Substance Control and Local Emergency Response Providers, and if appropriate, the National Response Center, of reportable quantities of hazardous waste, found or observed in solid waste anywhere within the CITY, including on, in, under or about City property, including streets, easements, rights of way and city waste containers. In addition to other required notifications, if COMPANY observes any substance which it or its employees reasonably believe or suspect to contain hazardous waste unlawfully disposed of or released on CITY property, including streets, storm drains, or public right or way, COMPANY also will immediately notify the City Manager, or the City Manager's designee.

9. TERMINATION PROVISIONS

If COMPANY fails, refuses or neglects to provide satisfactory service or sufficient equipment in providing residential curbside recycling service hereunder, CITY shall give written notice thereof setting forth particulars, and CITY may, at its option, terminate this Amendment if COMPANY has not taken all reasonable steps to cure the failure, refusal or neglect within thirty (30) days after receiving such notice. Similarly, COMPANY may terminate this Third Amendment for breach by CITY not cured within thirty (30) days after CITY receives written notice from COMPANY of the breach.

In all other respects, except as amended by this Third Amendment, the Franchise Agreement executed in June, 1984 and amended in February, 1990 and February, 1991 shall continue in full force and effect.

City of Morgan Hill, a Municipal Corporation of the State of California

Date: 6/19/92

By: _____
Jan C. Perkins, City Manager

South Valley Refuse Disposal Company, Inc., a California corporation

Date: 6/17/92

By: _____
Richard Lucchetti, President

6/17/92

1 INTRODUCTION

Hazardous chemicals are prevalent in modern society, not only in the commercial and industrial sectors, but also in 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 hazardous products are no longer needed by the consumer, they become household hazardous waste (HHW)[1]. 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)
- **toxicity**—capable of producing injury, illness, or damage to human, domestic livestock, or wildlife through ingestion, inhalation, or absorption through any body surface (e.g. rat poison, cleaning fluids, pesticides, bleach)

Such products include toxic pesticides, caustic drain openers, ignitable paint thinners and other reactive or explosive materials. Table 1-1 lists hazardous materials commonly found around the home, garage, and garden.

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1 A glossary of terms and acronyms is presented at the end of the document.

Until recently, programs to properly manage HHW were virtually non-existent, thereby resulting in wastes being disposed of in the garbage, down the sewer, into storm drains, or directly onto the ground. The improper disposal of hazardous substances can result in refuse workers being exposed to hazardous chemicals, equipment damage, contamination of ground water and surface water, and potential hazardous leachate migration from municipal solid waste landfills. Ultimately, improper disposal of HHW can lead to costly consequences.

Recognizing the dangers associated with the improper disposal of HHW, the City of Morgan Hill has worked cooperatively with its neighboring South County jurisdictions to properly manage HHW disposal and increase public awareness. As outlined in the following chapters, the City of Morgan Hill intends to continue and expand upon its efforts to properly manage the disposal of HHW.

Table 1-1
Hazardous Materials Commonly Found
Around the Home, Garage, and Garden

Household Products

- abrasive cleaners and scouring products (C,T)
- muriatic acid (C)
- ammonia-based cleaners (C,T)
- bleach (C,T)
- disinfectants (C,T)
- drain openers and cleaners (C,T)
- glass and window cleaners (C,T)
- oven cleaners (C,T)
- rug and upholstery cleaners (C,T)
- spot removers (F,T)
- toilet bowl cleaners (C,T)
- floor and furniture polish (T)
- aerosol sprays (R, F)
- moth repellents (T)
- rubbing alcohol (T, F)
- silver and brass polishes (T)
- hair colorings (T)
- nail acrylics (T, F)
- hair spray (F)
- pharmaceuticals (T)

Hobby/Workshop

- dry cell batteries (c)
- oil-based paints (F)
- oil-based woodstains (T,F)
- paint thinners (F)
- turpentine (F)
- acetone (F,T,R)
- varnish removers (T)
- paintbrush cleansers (T)
- contact cement (F,T)
- firearm ammunition (E)
- photographic chemicals (C,T)
- solvent-based glues (F,T)
- firearm-cleaning solvents (F, T)
- mineral spirits (F)

Garden and Garage Products

- chemical fertilizers (T)
- pool chemicals (C,T)
- fungicides (T)
- weed killers (T)
- insecticides (T)
- flea collars and sprays (T)
- tire cleansers (C)
- brake fluid (c)
- gas barbecues (F)
- kerosene (F)
- car waxes (F,T)
- antifreeze (F)
- brake fluid (F,T)
- used oil (T)
- propane cylinders (F)

Key to Symbols:

(C) corrosive
(F) flammable
(R) reactivity
(T) toxicity

Source:

1 *Household Products Guide, Handle with Extra Care,* BC Hazardous Waste Management Corp., 1990.

2 *Hazardous Household Products, A Guide to the Disposal of Hazardous Household Products and the Use of Non-Hazardous Alternatives,* Department of Health Services, Toxic Substances Control Program, OPGL-90-4.

2 GOALS AND OBJECTIVES

The City of Morgan Hill selected the following goals and objectives to properly manage HHW generated within the City. The objectives are organized according to the short-term (1991 to 1995) and medium-term planning periods (1996 to 2000).

2.1 Short-term Planning Period

- Provide education programs to promote the reduction of HHW entering the waste stream by encouraging
  - waste reduction, including the use of safer alternatives
  - proper use and disposal of hazardous products
  - proper storage and handling methods to protect the public's health and safety
- Conduct annual HHW collection events
- Reuse and recycle HHW to the extent possible

2.2 Medium-term Planning Period

- Continue education and public information programs implemented in the short-term planning period
- Continue to provide disposal alternatives for HHW generated in the City
- Recycle HHW to the extent possible

2.3 Targeted Materials

All household materials that have the characteristics of hazardous waste, (ignitability, toxicity, corrosivity, and reactivity) have been targeted for collection, except those excluded by the Department of Health Services.

Excluded household wastes include compressed gasses, explosives, and infectious or radioactive wastes.

3 EXISTING CONDITIONS DESCRIPTION

There are several HHW programs operating in Morgan Hill. The most significant of which is the annual HHW collection event that is co-sponsored by the City of Morgan Hill, the City of Gilroy and Santa Clara County. Additionally, South Valley Refuse Disposal, Inc. (SVRD) provides the City of Morgan Hill with several HHW programs. These include a HHW recycling program for used oil and vehicle batteries, a load checking program, both located at SVRD's transfer station and landfill, and a public education program. The following section describes the annual HHW collection event, the recycling program and the load checking program. Information regarding the public education program is provided in Chapter 9, Public Education and Information.

The Waste Generation Study conducted by Cal Recovery in 1991 indicated that residents have improperly disposed of HHW at the landfill. Approximately 30 tons of hazardous waste from Morgan Hill improperly enters the landfill annually. Only a small percentage of the 30 tons is likely to be of household origin.

3.1 Annual HHW Collection Event

The annual HHW collection event collects HHW from residents in unincorporated south Santa Clara County, and the cities of Morgan Hill and Gilroy. The collection event is held at the San Martin Transfer Station just south of Morgan Hill. Assistance to the program is provided by SVRD.

The event is normally held in the spring for five hours on one day. Staff from the participating City's fire departments supervise the overall safety of the site and monitor the contractor's performance. Sorted wastes are lab packed or consolidated in the packing area according to waste type. Table 3-1 identifies the quantity and types of HHW collected at the 1990 event.

3.2 Recycling Program

SVRD operates a recycling program for used oil and vehicle batteries. From January through September 1991, approximately 12,000 gallons of used oil and 653 vehicle batteries were collected for recycling at the San Martin transfer station. SVRD estimates that approximately half of the used oil and vehicle batteries collected at the transfer station was generated from Morgan Hill (the remaining waste is collected from the City of Gilroy and unincorporated south county areas).

3.3 Load Checking Program

SVRD operates a load checking program at the San Martin transfer station and the Pacheco Pass Landfill. The objective of the load-checking program is to discourage the improper disposal of prohibited waste at the landfill. Common examples of prohibited waste are paints, solvents, other flammables, pesticides, asbestos, polychlorinated biphenyls (PCBs), and inks. Quantities of HHW discovered through the load checking program have historically not been recorded.

Incoming loads are visually inspected for prohibited wastes. The gate attendant at the transfer station asks the public using the site whether they are disposing of prohibited materials. If prohibited materials are being disposed of, customers are requested to take the material home and are informed of alternative disposal options. Detailed prohibited waste inspections are also performed at the landfill. One day each week, a hazardous materials inspector sorts incoming loads brought to the landfill for prohibited waste. If the generator of the prohibited waste can not be determined, then proper disposal is arranged.

3.3 Status of Programs

None of the existing programs is anticipated to decrease in scope during the short- and medium-term planning periods.

Table 3-1

State of California | California Integrated Waste Management Board

HOUSEHOLD HAZARDOUS WASTE COLLECTION INFORMATION

CIWMB-303 (1/90)

1990 Event

Name of Local Agency: City of Morgan Hill

Phone:

Address: City: County: State: Zip:

(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	1800				RC
2. Paints					
a. Latex					
b. Oil Base				9	BF
3. Solvents, thinners, and stains				3	T-1
4. Gasoline and oil (mixed)					
5. Aerosols (excluding pesticides/ herbicides)	5			2	T-1
6. Other	20			1	T-1
FLAMMABLE SUBTOTAL	1825			15	

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.				13	T-1
PESTICIDE SUBTOTAL				13	
C. Corrosives					
1. Acids a. Oxidizing				3	T-1
b. Non-Oxidizing					
2. Alkaline				3	T-1
CORROSIVES SUBTOTAL				6	
D. Oxidizers					
Excluding acids	15			2	T-1
OXIDIZERS SUBTOTAL	15			2	
E. Miscellaneous					
1. Car Batteries			77		RC
2. Dry Cells					
3. Mercury					
4. Other				1	D
MISC. SUBTOTAL					
TOTAL WASTE COLLECTED	1840		77	37	

Household Hazardous Waste Element

City of Morgan Hill

Prepared for

City of Morgan Hill

November 1992

Prepared by

EMCON Associates
1921 Ringwood Avenue
San Jose, California 95131

Project G35-01.01

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4 EVALUATION APPROACH

4.1 Evaluation Criteria

The *Planning Guidelines and Procedures for Preparing and Revising Countywide Integrated Waste Management Plans, Section 18751.3, Chapter 9, Division 7, Title 14, California Code of Regulations,* require certain criteria to be used in evaluating alternative programs that are identified in the HHW element. These criteria reflect a broad range of technical, economic, and socio-political considerations. The evaluation criteria are described below in light of their application to HHW management programs.

4.1.1 Effectiveness

Effectiveness is the estimated percentage of the total HHW waste stream that the alternative reduces or diverts waste. This is a measure of the alternative's diversion effectiveness.

High: effective

Medium: negligible effect

Low: ineffective

4.1.2 Hazard[1]

Hazard refers to the potential hazards that are created by the alternative. Hazards can include health risks, injury, fire, or others identified for the alternative. A high rating corresponds to few or no potential hazards. This criterion is rated as follows:

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[1] Note that several of the criteria -- hazard, institutional barriers, facility requirements, and estimated costs -- are inherently negative. A rating of high for these criteria corresponds to few or no impacts associated with these potential problems.

High: There are few or no potential hazards. All potential hazards can be controlled.

Medium: There are some potential hazards that, for the most part, can be controlled.

Low: Potential hazards exist that are not completely understood or controllable, or the alternative increases the potential hazards.

4.1.3 Ability to Accommodate Change

Ability to Accommodate Change refers to the alternative's ability to accommodate changing economic, technological, and social conditions. This criterion is rated as follows:

High: The alternative is anticipated to be readily adaptable in meeting changing conditions. Significant changes in the program are not anticipated.

Medium: The alternative is anticipated to demonstrate a moderate ability to respond to changing conditions. Significant changes in the program may be required.

Low: The alternative has a limited ability to respond to changing conditions. Limitations may include inflexible or unpredictable markets for diverted materials, existing contracts with waste management companies, operational limitations, unwillingness of the public to participate in programs, or others identified for the alternative.

4.1.4 Implementation Period

Implementation Period refers to the potential for implementing the alternative in the short-term or medium-term planning periods. This criterion is rated as follows:

High: Implementation of the alternative is anticipated to be completed by 1995.

Medium: Implementation of the alternative is anticipated to be completed by 2000.

Low: Implementation of the alternative could not be completed until after 2000.

4.1.5 Facility Requirements

Facility Requirements refers to the need for expanding an existing facility or building a new facility to support the implementation of the alternative. This criterion is rated as follows:

High: The alternative can be easily integrated into an existing facility.

Medium: An existing facility must be expanded or altered to accommodate implementation of the alternative.

Low: A new facility must be developed to accommodate implementation of the alternative.

4.1.6 Consistency with Local Plans and Policies

Consistency with Local Plans and Policies reflects the alternative's consistency with local conditions, including local plans, policies, or ordinances. This criterion is rated as follows:

High: There are no existing local plans, policies, or ordinances that would impede the implementation of the alternative.

Medium: The alternative would require minor changes to existing local plans, policies, or ordinances for implementation.

Low: The alternative would require major changes to existing local plans, policies, or ordinances for implementation.

4.1.7 Institutional Barriers

Institutional Barriers refers to the potential for institutional barriers (such as long-term franchise agreements or other contracts), to impact the implementation of the alternative. This criterion is rated as follows:

High:	There are no existing institutional barriers to the alternative.
Medium:	The alternative is impacted by existing institutional barriers over which the jurisdiction maintains some control.
Low:	The alternative is impacted by existing institutional barriers that are not under the control of the jurisdiction.

4.1.8 Estimated Cost

Estimated Cost reflects the estimated order-of-magnitude implementation costs of the alternative, including capital costs and operating costs. A high rating corresponds to a relatively low order-of-magnitude cost. This criterion is rated as follows:

High:	$0-50,000
Medium:	$50,000-200,000
Low:	> $200,000

4.1.9 End Uses

End Uses reflects the availability of markets for the diverted materials. This criterion is rated as follows:

High:	Available end uses are relatively stable.
Medium:	End uses are available, but are subject to moderate fluctuations. The potential for the development of short-term markets may exist.
Low:	End uses are currently unavailable or unreliable, though the potential for the development of long-term or medium-term markets may exist.

5 EVALUATION OF ALTERNATIVES

This section presents an evaluation of alternative HHW programs that can be implemented in the City to meet HHW objectives. The following six alternatives were evaluated based on the evaluation approach presented in Section 4. For each evaluation criterion, a rating of high, medium, or low is assigned, and potential issues are discussed. The results of the evaluation are summarized in Table 5-1.

As structured by the regulations governing AB 939, some of the criteria by which the alternatives are required to be evaluated are positive in tone (e.g. consistency with local policies) while others are inherently negative (e.g., hazard). A high rating for each criterion implies a positive rating; and consequently a high rating for a negative criterion corresponds to few or no impacts associated with this potential problem. For example, a high rating for the hazard criterion means that there are no hazards for the alternative.

Many of these activities are complementary and depend significantly on the implementation of other alternatives or programs. The alternatives are evaluated for their effectiveness and impact on the entire HHW management system, including public education, collection, recycling, and monitoring, and not as independent alternatives. The alternatives evaluated are

- Alternative 1 - Periodic collection
- Alternative 2 - Permanent collection facility
- Alternative 3 - Mobile collection facility
- Alternative 4 - Curbside collection
- Alternative 5 - Load-checking program
- Alternative 6 - Recycling program

5.1 Alternative 1 - Periodic Collection Program

A periodic collection program is a collection event that operates at one or more locations for a short period of time, usually one or two days. A temporary collection program is staffed by trained personnel who collect, sort, and pack HHW into drums. Temporary collection programs can be conducted on an annual basis or as often as once a month. The City of Morgan Hill currently co-sponsors an annual HHW collection event with the City of Gilroy and Santa Clara County.

Effectiveness. Medium. Periodic collection programs are moderately effective at collecting the HHW generated by residents.

Hazard. Medium[1]. Potential public health risks and safety hazards associated with periodic collection include spills, fires, leaks, or explosions resulting from improper collection, storage, handling, or transport of hazardous materials. Proper design, equipment, and health and safety training, however, minimize any potential hazards.

Ability to accommodate change. Medium. Collection events are moderately adaptable to changing conditions.

Implementation period. High. Collection events can be implemented during the short-term planning period.

Facility requirements. High[2]. Collection events do not require expansion or development of facilities.

Consistency with local plans and policies. High. Providing periodic collections for residents to deliver HHW is consistent with local policies.

Institutional barriers. High[3]. Institutional barriers are anticipated to have minimal impact on this alternative.

Estimated cost. Medium[4]. The cost of this annual HHW collection event is shared by the sponsoring agencies. The City of Morgan Hill's annual budget for this is $10,000. Costs per event generally vary depending on the types of materials collected, the number of drums collected, and

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1 Refers to relative rating with respect to this criterion.

2 Note that several of the criteria -- hazard, facility requirements, institutional barriers, and estimated cost are inherently negative. A rating of high for these criteria corresponds to few or no impacts associated with these potential problems.

3 Ibid.

4 Ibid.

participation rates. A survey conducted by the CIWMB of HHW collection programs implemented in California indicated that the costs for a single periodic collection event range from $12,500 (Healdsburg) to $384,783 (Los Angeles).

End uses. Medium. Collection events divert latex paint, oil, and batteries from the waste stream through recycling. Nonrecyclable HHW collected through the events is either properly disposed of at a permitted hazardous waste disposal facility or incinerated.

5.2 Alternative 2 - Permanent Collection Facility

A permanent HHW collection facility accepts HHW delivered by residents at a fixed location and is generally open year round. Permanent facilities can be housed in either a prefabricated building or a permanent building and are usually sited to allow access from major population centers. A permanent facility can operate a program for exchanging materials to reduce the quantity of HHW requiring disposal. The DHS encourages the exchange of materials as long as certain safeguards are maintained.

Effectiveness. High. Permanent collection facilities are effective at reducing the amount of HHW that is disposed of in sanitary landfills by offering residents a collection facility available year round to deposit HHW.

Hazard. Medium-High. Potential public health risks and safety hazards associated with HHW collection include spills, fires, leaks, or explosions resulting from improper collection, storage, handling, or transport of hazardous materials. Proper design, equipment, and health and safety training, however, minimize any potential hazards. A permanent facility provides the safest means of collecting and properly disposing of HHW.

Ability to accommodate change. High. Permanent collection facilities can accommodate changing conditions by increasing or decreasing the days of operation, as needed. A permanent collection facility can process participants more efficiently than periodic collection events, because of dedicated staffing and operational characteristics of the facility. Recycling and waste exchange opportunities are also enhanced from increased storage time and experienced staff.

Implementation period. Medium. A permanent collection facility would likely not be implemented until the medium-term planning period due to budget and staffing constraints.

Facility requirements. Low. This alternative requires the development of a HHW collection and storage facility. A HHW facility must meet specific state and federal safety and operating standards. A facility should have separate storage bays to prevent spills or leaks from incompatible wastes from mixing, explosion proofing, proper containment, sufficient ventilation, and adequate emergency response and safety equipment. The permanent facility should be situated on an impervious surface and fenced for security. An area for analyzing unknowns is needed, in addition to safety and emergency equipment.

Consistency with local plans and policies. High. A multi-jurisdictionally sponsored permanent facility is consistent with local policies, plans, and ordinances.

Institutional barriers. High. Institutional barriers are anticipated to have little impact on this alternative.

Estimated cost. High. The estimated costs for a permanent collection facility vary depending upon the type of facility constructed, quantities collected, participation rates, and frequency of operation. Many communities are reducing the capital costs associated with a permanent facility by retrofitting storage containers or purchasing prefabricated storage lockers that range in cost from $17,00 to $45,000. To reduce hazardous waste disposal fees, items such as paint, oil, and automotive batteries can be recycled and a waste exchange program implemented.

End uses. High. Reuse of unopened, reusable products can be promoted through waste exchanges or organized referrals. Nonrecyclable HHW can be disposed of properly in a hazardous waste disposal facility or incinerated. Commonly recycled HHW includes latex paint, used oil, lead-acid batteries, and used antifreeze.

5.3 Alternative 3 - Mobile Collection Facility

A mobile collection facility is a portable facility that is set up at different locations within a community to collect HHW. A mobile collection program may consist of a modified trailer and support unit containing an electric generator, compressor, and water system; a fire response system; and a HazCat lab. A mobile unit usually includes a bathroom, emergency shower, and first aid station. A mobile facility should be capable of being dismantled quickly, once a collection event is completed. A mobile waste collection program is usually implemented City-wide. Residents in subur-

ban communities and unincorporated areas should be assured that a mobile collection unit would be within a 15- to 20-minute drive from their homes sometime during the year.

Effectiveness. High. A mobile collection facility is effective at collecting HHW generated by residents; in a dispersed area this alternative is very effective at providing convenient HHW disposal access to residents.

Hazard. Medium. Potential public health risks and safety hazards associated with mobile collection include spills, fires, leaks, or explosions resulting from improper collection, storage, handling, or transport of hazardous materials. Proper design, equipment, and health and safety training, however, minimize any potential hazards.

Ability to accommodate change. Medium. Several problems associated with mobile collection facilities limit their effectiveness in the City. Because the location is constantly changing, finding sites with adequate access, convenience, and safety is difficult. The public must be informed in advance of the location and time of events, so that participation will be at successful levels.

Implementation period. High. Approximately 1 to 2 years is required to operate a mobile collection facility.

Facility requirements. Medium. The mobile collection program requires a modified trailer and support unit. When set up for operation, the collection site will cover approximately 5,000 square feet of paved area with canopies over the work area. The collection site should be secured at night with a portable fence. Potential collection sites can be a church parking lot, fire department parking lot, or school parking lot.

Consistency with local plans and policies. High. A multi-jurisdictionally sponsored mobile collection program would be consistent with local policies.

Institutional barriers. Medium. Liability issues associated with entering into agreements to use private properties for collection activities may pose institutional barriers to mobile collection programs.

Estimated cost. Low. Based on available data, a mobile facility would cost between $90 to $100 per vehicle including waste management, personnel, public education, and equipment. The costs for a mobile

collection program appear to be higher than for a periodic collection program or permanent facility.

End uses. Medium. A mobile collection program can divert latex paint, oil, and batteries from the waste stream through recycling. Nonrecyclable HHW collected through the program are properly disposed of at a permitted hazardous waste disposal facility or incinerated.

5.4 Alternative 4 - Curbside Collection Program

An HHW curbside program offers residents an opportunity to place HHW at the curb for collection. Collection of recyclable HHW can be combined with refuse pickup or curbside recycling programs. Pickup of HHW must be conducted by a registered hazardous waste hauler, using licensed hazardous waste transport vehicles that comply with Department of Transportation (DOT) regulations. Vehicles used for this type of program are specially equipped to handle hazardous waste and require a staff trained in hazardous waste identification.

Once collected, the load is transferred to an approved treatment, storage, or disposal (TSD) facility or transported directly to a permitted hazardous waste disposal facility.

Effectiveness. High. A curbside collection program would help to reduce the volume and weight of HHW that is disposed of improperly in sanitary landfills.

Hazard. Low. Potential public health risks and safety hazards associated with curbside collection include spills, fires, leaks, or explosions resulting from improper collection, storage, handling, or transport of hazardous materials. Proper design, equipment, and health and safety training, however, minimize any potential hazards.

Another problem with curbside collection is the safe transport and handling of the materials because of the limited time and space constraints and accidental exposure of children or pets to the waste that is placed on the curbside.

Ability to accommodate change. Medium. Curbside collection programs for HHW are moderately responsive to changing social conditions. Certain materials such as oil and antifreeze can be integrated into curbside collection programs for recyclables relatively easily. To collect most

HHW, however, a permitted hazardous waste transport hauler using a licensed hazardous waste transport vehicle is required.

Implementation period. Medium-High. A curbside collection program can be implemented during the short-term planning period, if permitted hazardous waste management firms are contracted to routinely accept HHW using their existing hazardous waste facility permits, following notification by the DHS.

Facility requirements. Medium. Curbside collection events require trucks equipped to transport, handle, sort, and store hazardous materials. Curbside containers to store materials would also need to be provided to participants. A TSD facility may be required to store the HHW collected.

Consistency with local plans and policies. Medium. Because of the high costs associated with HHW curbside collection, it is not likely that the City would support a curbside collection program for all types of hazardous waste. However, recyclable HHW such as used oil can be cost-effectively integrated into curbside collection programs and would be consistent with local policies.

Institutional barriers. Low. The liabilities of a curbside collection program are significant, including potential hazards associated with the collection and transportation of HHW. The public may also be opposed to leaving household hazardous waste at the curbside, since children and pets could be at risk.

Estimated Costs. Low. The estimated costs for a curbside collection program would be significantly higher than for other collection alternatives. Additional costs would be incurred due to stringent collection and transportation requirements.

End uses. Medium. A curbside collection program can divert latex paint, oil, and batteries from the waste stream through recycling. Nonrecyclable HHW collected through the program can be properly disposed of at a permitted hazardous waste disposal facility or incinerated.

5.5 Alternative 6 - Load-Checking Program

SVRD operates a load checking program at the San Martin transfer station and the Pacheco Pass Landfill where wastes from the City are received. The purpose of a load checking program is to detect and deter attempts to dispose of prohibited waste. It involves a visual inspection for hazardous

waste at the entrance to the transfer station and landfill. 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 disposed of properly. SVRD notifies the proper authorities if a generator repeatedly tries to dispose of prohibited wastes.

Effectiveness. Low. A load checking program will primarily help to reduce the amount of prohibited materials disposed of in solid waste landfills. It will also help to educate generators of hazardous waste about the proper disposal alternatives available. Once generators realize the limited disposal alternatives for hazardous waste, they may consider ways they can reduce the amount of waste they generate.

Hazard. Low. The potential hazards of a load checking program include the risk from exposure to the prohibited waste while inspecting or handling the waste.

Ability to accommodate change. Medium. Load checking programs can be adjusted to changing conditions.

Implementation period. High. The load checking program will be expanded during the short-term planning period.

Facility requirements. High. Hazardous wastes discovered during the load checking program will be temporarily stored on site and ultimately disposed of at a hazardous waste disposal facility.

Consistency with local plans and policies. High. The load-checking program is consistent with the City's policy of keeping prohibited wastes from entering sanitary landfills.

Institutional barriers. High. Institutional barriers have a minimal impact on this alternative. The State Water Resources Control Board (SWRCB) requires landfills to operate hazardous waste load-checking programs (Section 2523, Title 23, California Code of Regulations [CCR]). The DHS and CIWMB require solid waste facilities to follow certain procedures regarding their load-checking programs. The DHS requires a solid waste facility with a hazardous waste load-checking program to obtain an identification number as a hazardous waste generator. If hazardous waste will be stored for less than 90 days, no hazardous waste permit is needed, if the facility complies with state regulations. If hazardous waste will be stored for more than 90 days, however, the solid waste facility must apply to the DHS for a hazardous waste facility permit or variance.

Estimated cost. High. According to information provided by SVRD, the total load checking program costs are approximately $49,000 per year, including staffing, and related transport and disposal costs.

End uses. Low. HHW collected through the program are properly disposed of at a permitted hazardous waste disposal facility or incinerated.

5.6 Alternative 6 - Recycling and Reuse Program

A recycling and reuse program helps reduce the high costs of disposing of hazardous materials that have the potential to be recycled. SVRD operates a recycling drop-off program for used oil and vehicle batteries. The HHW recycling program may be expanded at the transfer station to include latex paint in the future. Used oil will be collected in a curbside collection program, should the City approve the existing planned development of such a program. By recycling HHW, the City can help preserve resources and reduce the high cost of properly disposing of HHW.

Effectiveness. High. Recycling and reuse programs are extremely effective at reducing the volume and weight of HHW generated.

Hazard. Medium. Recycling HHW produces minimal hazards. Some hazards are associated with latex paint; older latex paint may contain mercury or lead. To reduce potential hazards, older latex paint, improperly labeled paint, paint that is not in its original container, and possibly contaminated paint should be disposed of instead of recycled.

Ability to accommodate change. High. Recycling and reuse programs can adjust to changing conditions.

Implementation period. High. A recycling program for used oil and vehicle batteries is presently in operation. SVRD may expand the existing HHW recycling program to include latex paint during the short-term planning period.

Facility requirements. High. Recycling operations can be conducted at existing facilities such as the San Martin Transfer Station.

Consistency with local plans and policies. High. Recycling and reuse of HHW is consistent with the City's policy of recycling and providing collection options for HHW.

Institutional barriers. High. Institutional barriers are anticipated to have little impact on this alternative. 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 (1) latex paint, (2) used oil, (3) antifreeze, (4) spent lead acid batteries, and (5) nickel-cadmium, alkaline, carbon-zinc, and other small batteries.

Section 25250.11(a), Health & Safety Code, exempts from its hazardous waste 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 than 5 gallons each. The DHS will allow a facility or collection event to bulk latex paint if it is properly authorized to accept the paint as one of its household hazardous wastes.

Government Code Section 66798.9 provides immunity for local agencies operating HHW programs unless the agencies act negligently. Additional immunity from state liability is provided in Health & Safety Code, Section 25366.5, for local governments or their contractors who are running HHW facilities and events.

Estimated cost. High. Recycling and reusing HHW reduces the costs of disposal for HHW collected during collection events, at recycling centers, or at permanent facilities. No specific costs are associated with a recycling program because it can be implemented in conjunction with these other collection programs.

End uses. High. Reuse of unopened reusable products can be promoted via waste exchanges or unorganized referrals, common use 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 sorted, consolidated, and sent to a paint company, which can mix it with its own waste paint and manufacture new paint.
- 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. "After the lead is separated from the non-metallic components of the battery, it is then smelted to produce soft lead and lead alloys. Most of these lead products are used to make new lead acid batteries. The non-metallic materials include sulfuric acid, which is neutralized and released into the sewer; the plastic shell is reclaimed; and other non-recyclable, non-hazardous material is disposed of." (*Household Hazardous Waste, Lead-Acid Batteries,* CIWMB, September 1990).

- Antifreeze. Used antifreeze can be recycled for use by the mining and glycol industries. Antifreeze is sprayed on coal to keep it from sticking together. In addition, antifreeze can be used for airplane de-icing solution, cement grinding, and brake fluid. (*Household Hazardous Waste, Antifreeze,* CIWMB, September 1990).

Table 5-1

Summary of Alternatives Evaluation

Criteria	Program Alternatives					
	Collection Events	Permanent Facility	Mobile Collection	Curbside Collection	Load Checking Program	Recycling Program
Effectiveness	Medium	High	High	High	Low	High
Hazard	Medium	Medium-High	Medium	Low	Low	Medium
Ability to accomodate change	Medium	High	Medium	Medium	Medium	High
Implementation Period	High	Medium	High	Medium-High	High	High
Facility requirements	High	Low	Medium	Medium	High	High
Consistency with local policies	High	High	High	Medium	High	High
Institutional barriers	High	High	Medium	Low	High	High
Estimated Cost	Medium	High	Low	Medium	High	High
End Uses	Medium	High	Medium	Medium	Low	High

6 PROGRAM SELECTION

6.1 Alternatives Selected

In the previous section, alternative HHW programs were presented. The City of Morgan Hill selected various programs that are presented below. Several factors were taken into consideration during the program selection process: (1) the degree to which each program is appropriate to the City of Morgan Hill, and (2) the degree to which the programs complement each other and form a coherent, comprehensive, and cost-effective package.

Programs selected for HHW management are organized according to the short-term and medium-term planning periods.

6.1.1 Short-term Planning Period

The programs selected to manage HHW during the short-term planning period include:

- periodic collection events
- recycling program
- load-checking program

Periodic collection events. The City will continue to sponsor its annual HHW collection events during the short-term planning period. Additionally, the City will evaluate the feasibility of participating in the County-sponsored mobile collection/permanent collection site program in order to provide residents with additional HHW collection opportunities.

Recycling program. SVRD currently operates a recycling program for used oil and vehicle batteries. The recycling program will likely be expanded to include latex paint during the short-term planning period.

Load Checking Program. The San Martin Transfer Station and the Pacheco Pass Landfill currently operate load checking programs. A load checking program detects prohibited wastes from entering the landfill. The State Water Resources Control Board requires landfills to operate hazardous waste load-checking programs (Section 2523, Title 23, CCR).

6.1.2 Medium-term Planning Period

The following program was selected to properly manage HHW in the medium-term planning period.

Permanent HHW collection facility. A permanent facility will offer the public a convenient, fixed location to deposit HHW. A permanent facility will also reduce the potential liability to the City of Morgan Hill from the improper disposal of HHW in the landfill.

The collection facility will sponsor a program for exchanging HHW materials. The DHS encourages the exchange of materials as a means of waste reduction. The permanent facility will also collect recyclable HHW.

6.2 Types and Quantities of HHW

The HHW programs selected are designed to increase the collection of HHW and the public's awareness of the hazards of HHW. The program's success in collecting HHW will depend on the education and public information programs and the public's behavior changes.

The CIWMB surveyed HHW programs in 1989. The survey indicated that typically paint, household and lead acid batteries, and used oil comprise approximately 68.5 percent of the HHW collected during collection programs. The remaining 31.5 percent consists of flammables, pesticides, corrosives, and other HHW. The City expects to collect about the same proportions of HHW. At present, determining the quantities of HHW that will be collected is difficult. The HHW program will, however, be designed to accept varying quantities of HHW, should the quantities anticipated to be collected increase.

6.3 Recycling and Reuse Efforts

A recycling program for used oil and vehicle batteries is currently operated by SVRD. The program will likely be expanded to include latex paint during the short-term planning period. In addition, used oil will be col-

lected in a planned residential curbside recycling program, should the City approve such a program.

6.4 Multijurisdictional HHW Efforts

The County of Santa Clara is developing a Countywide HHW program that provides mobile services and a permanent site for collection of HHW. The City will evaluate the costs and benefits of participating in this program after it becomes operational.

6.5 Facility Needed for Implementation

The HHW program will require a permanent HHW facility in the medium-term planning period to store hazardous materials. The City of Morgan Hill may participate in the County-operated HHW program or develop a multi-jurisdictional program with the City of Gilroy, that may possibly be located at the San Martin Transfer Station.

6.6 Handling and Disposal Methods

Proper handling and disposal methods are guided by state and federal regulations. The HHW program will be staffed by professionals certified to handle hazardous materials. Licensed hazardous waste haulers will be contracted to remove the collected materials.

7 PROGRAM IMPLEMENTATION

The following section describes the tasks necessary to implement the selected programs.

7.1 Government Agencies Responsible for Implementation

The City of Morgan Hill Community Development Department, working in conjunction with the Morgan Hill Fire Department, will be responsible for managing HHW programs.

7.2 Tasks Necessary to Implement Program

The selected HHW programs will require the following implementation tasks.

Periodic Collection Events

- contract for operation, transportation, recycling, and disposal
- develop program schedule and select sites
- advertise event
- hold event
- develop recordkeeping

Recycling Program

- purchase equipment and supplies for latex paint collection
- publicize program

Permanent HHW Facility

- evaluate alternative sites and select site locations

- prepare permitting documents and CEQA documentation
- identify funding sources
- identify entity operating facility
- identify specific wastes to be handled
- estimate number of drums to be handled each month
- develop design criteria for permanent facility, including sizing, containment features, storage needs, fire safety requirements, ventilation and heating needs, laboratory and office space needs
- obtain equipment and supplies
- contract for waste transportation, recycling, and disposal services
- develop record keeping system

7.3 Implementation Schedule

Collection Events	Ongoing Program
Recycling Program	Existing Program
Permanent Collection Facility	Completed by 2000

7.4 Implementation Costs

Table 10-1 summarizes the costs for each selected program.

8 MONITORING AND EVALUATION

8.1 Methods to Quantify and Monitor Achievement of Objectives

To effectively monitor the achievement of the objectives, several tasks should be performed, these are summarized below.

Objective: Provide education programs to promote the reduction of HHW entering the waste stream

- Survey collection program participants to determine if their buying practices have changed towards the purchase of safer alternatives
- Survey residents to determine if they are aware of the proper use of and disposal requirements for hazardous products

Objective: Provide disposal alternatives

- Monitor the implementation of the selected programs against the implementation schedule
- Determine the funding needed to ensure continued operation of the program
- Prepare annual summary reports and evaluations of the status of the programs

Objective: Establish a waste exchange program to reduce the amount of HHW requiring disposal

- Provide an annual report on the types and quantities of HHW that is reused through a waste exchange program

Objective: Recycle HHW to the extent possible

- Provide an annual report on the types and quantities of HHW being recycled
- Survey residents to determine if they are aware of the recycling program for used oil, vehicle batteries, and latex paint

8.2 Written Criteria for Evaluating Program's Effectiveness

The City of Morgan Hill will evaluate the success of each HHW program implemented by the following criteria:

- **Quantity and type of HHW collected.** The quantity and type of HHW collected or otherwise diverted from disposal will be recorded by specific waste type using CIWMB Form 303 (see Table 2), with units of weight recorded.
- **Disposal quantity.** The quantity of collected HHW disposed of will be summarized by waste type and weight along with the cost of disposal.
- **Recycled quantity.** The amount of recycled HHW will be summarized by waste type and weight along with the cost for recycling.
- **Staffing requirements.** The level of staffing needed to effectively manage the selected HHW programs will be evaluated to determine if adequate staffing is being allocated for the proposed programs.
- **Households utilizing programs.** Each program will monitor the locations of residents utilizing the programs to determine if residents in certain areas need to be targeted for education and public information or if additional collection programs need to be implemented to serve these residents

8.3 Responsible Parties for Monitoring, Evaluating, and Reporting

The City of Morgan Hill Community Development Department will oversee the responsibility of the HHW program, including monitoring, evaluating, and reporting.

8.4 Monitoring and Evaluation Funding Requirements

Monitoring and evaluation of HHW management in Morgan Hill will be funded through the city's refuse franchise fund. Funds have been budgeted for administrative activities such as record keeping, tracking demographics, and annual report writing.

8.5 Measures to be Implemented if Shortfall in the HHW Objectives

If the HHW objectives described in Section 1 fail to meet the goals of reducing and recycling HHW, the following tasks will be considered for implementation:

- increase the level of effort for education and public information
- increase and/or change the days or hours of operation for selected programs

9 EDUCATION AND PUBLIC INFORMATION

Education and public information are separate functions that work together towards a common goal. Education is an ongoing activity that explains, through knowledge and awareness, *why* waste reduction programs are necessary. Public information is a method of letting the public know *how* to effectively participate in programs. Both ongoing education and public information are essential to the successful implementation of the HHWE.

A community could fall short of its goals if it merely selects programs without providing methods of informing and educating the people who generate the waste. Changing the behavior of the community as a whole is an essential component of these programs.

This section presents education and public information objectives and identifies existing and proposed education activities for achieving those objectives.

9.1 Objectives

The City of Morgan Hill selected the following education and public information objective to augment the selected HHW management programs. The objective applies to both the short and medium term planning periods (1991-2000).

9.1.1 Objective: Promote Source Reduction, Safer Use, and Proper Disposal of HHW

Source Reduction. Source reduction information will be distributed to residents regarding the availability of non-hazardous substitutes.

Proper use and storage. Information will be distributed to residents about the hazardous nature of some products and methods for proper use and storage of such products.

Proper disposal. Information will be distributed about the environmental hazards associated with improper disposal of HHW.

9.2 Existing Education and Public Information Programs

The following is a summary of HHW public education programs used in the City to promote proper use and disposal of hazardous products.

- **Load Checking Program Notices** - SVRD sent a notice to its customers informing them that a load checking program is in operation at the landfill. The notice also list common types of prohibited materials, and provides a phone number to call for additional information.
- **Source Reduction Pamphlets** - A brochure developed by the Morgan Hill Fire Department, Office of Emergency Services, entitled *Household Hazardous Waste,* is being distributed to residents participating in annual HHW collection events. The brochure provides information on safer substitute products, and household cleaning tips that can reduce the use of hazardous products in the home. SVRD distributes a brochure at the transfer station entitled *Making the Switch, Alternatives to Using Toxic Chemicals in the Home,* developed by Golden Empire Health Planning Center in cooperation with the Sacramento League of Women Voters.
- **HHW poster** - Self-haulers at the transfer station can obtain a poster featuring "Hare E. Hazard" who provides tips on proper use and disposal, safer substitute products, and phone numbers to call for additional information.

9.3 Program Description

Education and public information programs proposed for City of Morgan Hill, include increasing public awareness about the HHW management services available. Additional educational materials are currently available from several agencies and organizations, including the DHS, the CIWMB, the League of Women Voters, and local governments throughout the United States.

The City will continue to provide residents in the City with educational materials on HHW issues. The following additional public education programs will be implemented to augment the existing programs.

- Display HHW information on public bulletin boards to provide information to the general public
- prepare articles and news releases for the local newspaper on issues related to HHW
- integrate a hazardous waste curriculum into school programs
- provide speakers on toxic issues to community groups
- develop and emphasize reuse options (e.g. paint to community groups, housing groups, neighbors, and schools)
- when feasible, develop bilingual education materials

9.4 Program Implementation

9.4.1 Community Audiences to be Targeted

The education and public information program will target the following groups:

- residents in the City of Morgan Hill
- self-haulers to the transfer station and landfill
- schools

9.4.2 Government Agencies Responsible for Implementation

The City of Morgan Hill Community Development Department will be responsible for implementing and monitoring the effectiveness of public education efforts.

9.4.3 Implementation Tasks

Public education.

- Advertise HHW programs 1991, ongoing

- Participate in ongoing HHW public education efforts — 1991, ongoing
- Disseminate source reduction and product-specific information pamphlets — 1991, ongoing

9.4.4 Costs and Sources of Funding

Funding sources for public education programs are discussed in Chapter 10.

9.5 Monitoring and Evaluation

9.5.1 Evaluation Methods

The methods described below will be used to measure achievement of the education and public information objectives.

Objective - Promote Source Reduction, Safer Use, and Proper Disposal of HHW

- Residents will be surveyed to determine whether their level of awareness has increased regarding safe use and disposal practices. Results of the survey will be included in the annual reports.
- Data from program records will be reviewed to determine the adequacy of HHW program advertising efforts.

9.5.2 Written Criteria for Evaluating Program Effectiveness

The City of Morgan Hill 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 non-hazardous products.

9.5.3 Agencies Responsible for Monitoring, Evaluation, and Reporting

The City of Morgan Hill Community Development Department will be responsible for monitoring, evaluation, and reporting.

9.5.4 Funding Requirements and Sources for Monitoring and Evaluation

See Chapter 10, Funding, for a discussion of monitoring and evaluation funding requirements.

9.5.5 Contingency Measures

Should 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

9.5.6 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 1992.

10 FUNDING COMPONENT

Adequate and long-term funding is an essential component of a successful HHW management system. Inadequate funding can cause an otherwise effective program to fail. The purpose of the funding component is to demonstrate that the City has sufficient funds and allocation of resources to plan, develop, and implement the programs identified in this document.

This section briefly describes (1) the current mechanisms used to fund solid waste and HHW programs (2) estimated costs for the programs scheduled for implementation in the short-term planning period, (3) revenue sources to support the programs, and (4) contingency funding sources.

10.1 Current Funding Sources

The source of funding for waste management activities is revenues generated by the franchise fee with SVRD. The franchise fee is a percentage of the waste collection fees. The current annual budget for HHW activities is approximately $10,000.

10.2 Estimated Program Costs

Estimated costs have been determined for each of the new or expanded programs that have been identified in Chapter 5 for implementation during the short-term planning period. Table 10-1 shows the estimated operating costs for each of these programs.

10.3 Revenue Source for New and Expanded Programs

City franchise fee revenues will provide the funding for City-sponsored HHW programs. Programs that are operated by SVRD will be funded through refuse collection fees.

10.4 Contingency Funding Sources

Funding sources and mechanisms that could be explored if a shortfall in waste management funds occurs are as follows:

- Special taxes or assessment. These can take the form of short-term taxes or assessments to develop HHW programs.
- CIWMB non-discretionary HHW grant - Four million dollars is available from the CIWMB annually for the grant program. Funding eligibility is open to cities, counties, and local agencies that have implemented HHW programs such as construction of a permanent HHW facility, sponsorship of periodic collection day programs, and operation of load checking programs, etc.

Table 10-1
Implementation Costs for Selected Programs

Programs	Estimated Annual Costs
Short-Term Programs	
Alternative 1	
- Periodic Collection Events	10,000
Alternative 5	
- Load Checking Program[1]	____[1]
Alternative 6	
- Recycling Program[1]	____[1]
Alternative 7	
- Public Education and Information[2]	____[2]

1. Program funded through SVRD's existing rate structure.
2. Costs are included in the public education costs identified in the SRRE.

ACRONYMS

DHS	Department of Health Services (California)
EPA	Environmental Protection Agency
HHW	Household Hazardous Waste
HSC	Health and Safety Code (California)
MSW	Municipal Solid Waste
PCB	Polychlorinated Biphenyl
RCRA	Resource Conservation and Recovery Act
SQG	Small Quantity Generator
TSDF	Treatment, Storage and Disposal Facility

GLOSSARY OF TERMS

Acid - Chemical compound or solution which has a low pH (below 7). Strong acids are corrosive to many materials, especially metals. Acids with pH equal to or below 2.0 are considered hazardous.

Capital Costs - Those direct costs incurred in order to acquire real property assets such as land, buildings and building additions; site improvements; machinery; and equipment.

Characteristics of Hazardous Wastes - Characteristics identifying substances as hazardous waste, by their physical and chemical properties. EPA has established four characteristics that can be determined by tests:

- Ignitability - The ability to catch fire.
- Corrosivity - The ability to wear away or destroy other materials, including human tissue.
- Reactivity - The ability to enter into a violent chemical reaction, which may involve explosion or fumes.
- EP (Extraction Procedure) Toxicity - The ability to release certain toxic constituents when leached with a mild acid.

Disposal - Abandoning, depositing, interring, or otherwise discarding waste as a final action after use has been achieved or a use is no longer intended. (Section 66048, Title 22, California Administrative Code; the Department of Health Services is proposing to revise this definition.)

Disposal Site - An area, location, tract of land, building, structure or premises used or intended to be used for disposal of refuse or hazardous waste.

Environmental Protection Agency - A federal agency, established in 1970, which, among other duties, has responsibility for ensuring that governmental, residential, commercial and industrial waste-disposal activities do not adversely impact the environment.

Flammable - Material which will burn below 140°F, either spontaneously or as a result of coming in contact with sparks or flame.

Generator - The person, company, or facility that, by nature or ownership, management or control, is responsible for producing (or allowing to be produced) the hazardous waste.

Hazard - Having one or more of the characteristics that cause a substance or combination of substances to qualify as a hazardous material, as defined by section 66084 of Title 22 of the California Code of Regulations.

Hazardous Waste - is a waste, or combination of wastes, which because of its quantity, concentration, physical, chemical, or infectious characteristics, may either (1) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness, or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of, or otherwise managed. The term "hazardous waste" includes extremely hazardous waste, unless otherwise specified (Section 25117 of the Health and Safety Code). Examples of hazardous wastes include strong acids, explosives, flammables, toxic chemicals, and corrosives.

Heavy Metals - A group of metallic elements with high atomic weights and densities. Toxic heavy metals include arsenic, cadmium, chromium, lead, mercury, nickel, selenium, and thallium.

Herbicide - A chemical used to kill plants.

Household Hazardous Wastes - Hazardous wastes resulting from the use of such household products as paint products, solvents, insecticides, oven cleaners, disinfectants, medications, and drugs. Generally any products labeled poison, corrosive, flammable, or toxic belong in this category.

Incineration - The controlled combustion of burning solid, liquid or gaseous waste, producing gases and ashy residue containing little combustible material. This reduces the volume and toxicity of the hazardous wastes.

Land Disposal Method - Disposal, storage or treatment of hazardous wastes on or into the land, including, but not limited to, landfill, surface impoundment, waste piles, deep-well injection, land spreading, and co-burial with municipal garbage.

Landfill - A disposal site employing an engineered method of disposing solid wastes on land in a manner that minimizes environmental hazards by spreading solid wastes in layers, compacting the waste to the smallest practical volume and applying cover materials at the end of each operating day.

Lead Agency - The public agency which has the principal responsibility for the execution or approval of the project. For example, under the California Environmental Quality Act, such an agency decides if an EIR or negative declaration will be required for the project and causes the document to be prepared.

Manifest - A State form which indicates generator, quantity, type of waste, and disposer of waste for each shipment of hazardous wastes handled in off-site facility.

Materials Recovery Facility - A permitted solid waste facility where solid wastes or recyclable materials are sorted or separated, by hand or by use of machinery, for the purposes of recycling or composting.

Medium-Term Planning Period - A period beginning in the year 1996 and ending in the year 2000.

Municipal Solid Waste or MSW - All solid wastes generated by residential, commercial, and industrial sources, and all solid waste generated at construction and demolition sites, at food-processing facility, and at treatment works for water and waste water, which are collected and transported under the authorization of a jurisdiction or are self-hauled.

Normally Disposed Of - Those waste categories and waste types which: (1) have been demonstrated by the Solid Waste Generation Study, conducted pursuant to CCR, Title 14, Section 18722, to be in a solid waste stream attributed to the jurisdiction as of January 1, 1990; (2) which are deposited at permitted solid waste landfills or transformation facility subsequent to any recycling or composting activities at those solid waste facility; and (3) which are allowed to be considered in the establishment of the base amount of solid waste from which source reduction, recycling, and composting levels shall be calculated, pursuant to the limitations listed in Public Resources Code section 41781(b).

On-Site Disposal - Treatment of waste material on the premises where they were generated.

Operator - A person, industry, or agency that conducts the treatment, disposal and/or storage of hazardous materials.

Permit to Operate - A mandate issued by Air Pollution Control Districts and Air Quality Management Districts, which is required before operation of a facility, based on a demonstration that the facility can comply with applicable rules, regulations and conditions imposed in the Authority to Construct.

Permitted Landfill - A solid waste landfill for which there exists a current Solid Waste Facility Permit issued by the local enforcement agency and concurred in by the California Integrated Waste Management Board.

Pyrolysis - The process of heating combustible hazardous waste in the absence of oxygen, usually breaking the waste down to a residue of reduced toxicity.

Re-Use - The use, in the same form as it was produced, of a material which might otherwise be discarded.

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

Recycling[1] - A series of activities by which materials that would become or otherwise remain waste are diverted from the solid waste stream for collection, separation, and processing and are used as raw materials or feedstocks in lieu of, or in addition to, virgin materials in the manufacture of goods sold or distributed in commerce, or the reuse of such materials as substitutes for goods made from virgin materials.

Reduction - A chemical reaction involving the addition of electrons to atoms or compounds; the opposite of oxidation, (not the same as waste reduction).

Reusability - The ability of a product or package to be used more than once in its same form.

Short-Term Planning Period - A period beginning in the year 1991 and ending in the year 1995.

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1 As defined by the natural Recycling Advisory Council in *Recycling Times*, December 18, 1990.

Small Quantity Generator (SQG) - A generator of waste material amounting to less than 1,000 kilograms of hazardous waste per month.

Solid Waste - Discarded material with insufficient liquid to be free-flowing. Examples of this include garbage, rubbish, paper, ashes, industrial wastes, abandoned vehicles, manure, vegetable or animal solid and semisolid wastes, and other discharged solid and semisolid wastes.

Solvent - A liquid capable of dissolving another substance. Common solvents include water, acetone, alcohol, and paint thinner.

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

Storage Facility - A hazardous waste facility at which hazardous waste is contained for periods greater than 96 hours at an off-site facility or for periods greater than 90 days at an on-site facility. (Health and Safety Code Section 25123.3)

Tipping Fee - A fee, usually dollars per ton, for the unloading or dumping of waste at a landfill, transfer station, recycling center, or waste-to-energy facility, usually stated in dollars per ton; also called a disposal or service fee.

Ton - A unit of weight in the U.S. Customary System of Measurement, an avoirdupois unit equal to 2,000 pounds. Also called short ton or net ton.

Toxic - Capable of producing injury, illness, or damage to humans, domestic livestock or wildlife through ingestion, inhalation, or absorption through any body surface.

Transfer Station - A fixed facility used for transferring waste from small collection trucks or trains, packaging for transport, and loading it into larger vehicles, and directing it toward large capacity treatment or disposal facility.

Treatment - Any method, technique or process, including neutralization, designed to change the physical, chemical or biological character or composition of any hazardous waste so as to neutralize such waste, or so as to recover energy or material resources from the waste or so as to render such waste nonhazardous.

Treatment Facility - Any facility at which hazardous waste is subjected to treatment or where a resource is recovered from a hazardous waste.

TSDF - A treatment, storage or disposal facility. This may also include transfer stations. This term is used in definitions of federal regulations.

Variance - An exemption from the Department's permitting process which is granted under special, stated conditions. Notifications of variances are sent to the local environmental health and land use planning departments and such facility are still subject to local land use permits.

Volume - A three dimensional measurement of the capacity of a region of space or a container. Volume is commonly expressed in terms of cubic yards or cubic meters. Volume is not expressed in terms of mass or weight.

Waste - Material which is discarded by the generator as no longer useful to the generator.

Waste Exchange - A network connecting waste generators with parties that can use treated or untreated hazardous wastes as raw materials for industrial processes.

Waste Reduction - On-site practices that eliminate, reduce, or avoid the need for off-site hazardous waste facility.

Section 66680 of Title 22 of the CAC presents a list of chemicals and common wastes and their respective potential hazardous properties.