EBA WASTECHNOLOGIES

# CITY OF WOODLAND

# SOURCE REDUCTION AND RECYCLING ELEMENT

MARCH 1992

*ENGINEERS & ENVIRONMENTAL CONSULTANTS*

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# SOURCE REDUCTION AND RECYCLING ELEMENT

MARCH 1992

91-263

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# SECTION 1

## EXECUTIVE SUMMARY

The Source Reduction and Recycling Element (SRRE) for the City of Woodland was developed in accordance with the requirements of the California Integrated Waste Management Act of 1989 (AB 939). The primary purpose of the SRRE is essentially to function as a guide to evaluate source reduction, recycling, and composting alternatives; provide a framework in making program selections; and ultimately provide an integrated waste management plan to reduce solid waste disposal by 25 percent by 1995 and 50 percent by the year 2000.

### SRRE CONTENTS

The development of the SRRE was based on AB 939 regulations and accompanying legislation which define content requirements for each waste management plan. Specific plan components are the following:

- Source Reduction Component - This component identifies waste reduction programs to assist residential and commercial/industrial waste sectors in reducing the quantity of waste generated.

- Recycling Component - The Recycling Component identifies and evaluates recycling programs targeting the residential and commercial/industrial waste sectors.

- Composting Component - This component evaluates feasible collection and processing alternatives for the diversion of green waste.

- Special Waste Component - The Special Waste Component identifies diversion options for waste types considered to be a "special waste" such as sewage sludge, industrial waste, etc.

- Education and Public Information Component - This component describes educational and promotion efforts designed to facilitate selected waste diversion programs.

- Facility Capacity Component - This component identifies waste disposal facilities utilized by the City and projects future waste capacity needs.

- Funding Component - The Funding Component summarizes program costs during the short-term planning period (1991 through 1995) and identifies funding sources.

- Integration Component - The Integration Component demonstrates how the selected programs will result in a 25 and 50 percent waste reduction and provides an implementation schedule by task.

## WASTE CHARACTERIZATION

The initial stage in the development of the SRRE was a waste characterization study conducted in April of 1991. The purpose of this study was identify the types and quantities of waste materials currently disposed of and diverted from disposal by residential, commercial and industrial waste generators in the City.

The Solid Waste Generation Study (SWGS) indicates that approximately 67,200 tons of waste is currently disposed of in the City on an annual basis. Approximately 21 percent is generated from residential sources, commercial/industrial sources account for an estimated 57 percent, and self-haul sources dispose of approximately 7 percent of the City's waste stream.

Waste diversion efforts within the City currently divert approximately 20 percent of the waste stream through source reduction, recycling, composting, and transformation activities. Approximately 13 percent of the City's current diversion is the result of inert waste recycling taking place at the Yolo County Central Landfill; however, the California Integrated Waste Management Board may not allow inert waste diversion to be counted towards the City's waste diversion goals. This issue will likely be resolved in 1992. Waste incineration (transformation) activities in the City account for approximately 2.6 percent of the waste stream which can be counted towards waste diversion goals in the medium-term planning period.

## PROGRAMS SELECTED

Waste management program selections by the City are based on the City's desire to provide Woodland residents and businesses the opportunity to participate in waste diversion programs on a voluntary basis. Selections are also based on providing the most cost effective programs available to achieve the City's waste diversion goals and to participate in County efforts to provide regional waste management programs. Participation in these programs allows the City to take full advantage of economies of scale in the development of regional processing facilities and to provide consistent waste management programs throughout the County.

The City of Woodland has developed an integrated waste management plan that places preferences on source reduction, recycling, and composting programs as management practices for waste generated and disposed of in the jurisdiction. Selected programs provide the means for residential and commercial/industrial waste generators to participate in waste diversion programs through source reduction efforts and material collection programs provided by the City and the franchised waste hauler.

The City's solid waste management plan establishes the following programs to meet state

mandated diversion goals.

## Source Reduction Programs

Source reduction programs selected by the City are designed to reduce the quantity of waste generated and disposed of in the City. Selected programs will also provide examples of source reduction methods to local business through City demonstration programs and model non-procurement and procurement policies. The source reduction programs which have been selected for implementation by the City are summarized below.

### Existing Programs

During the short-term planning period the City will devise methods to identify and quantify the levels of diversion taking place through current source reduction activities in the City. The types of source reduction activities targeted would include thrift shops, repair shops, and other similar businesses.

### Quantity Based Variable Rates or User Fees

This alternative has been selected as a contingency measure to facilitate diversion programs should the City fall short in meeting its waste diversion goals. Due to the fact that the current refuse collection rate is incorporated into a larger utility user fee, a feasibility and rate study will be conducted to provide separate refuse service fees and to determine the rates necessary to provide solid waste collection and recycling services to the residential and commercial/industrial waste sectors. This study is scheduled to take place in 1993. A quantity based variable rate structure would be implemented in 1995 if its determined that the City is not reaching waste diversion goals.

### Backyard Composting

Backyard composting has been selected for implementation in the short-term planning period to reduce the quantity of yard waste currently disposed. Though yard waste currently collected at curbside is anticipated to be diverted through the County's regional composting facility, City education efforts to promote backyard composting will serve to reduce the quantity of yard waste collected, transported, and composted at the facility.

The County is currently proposing a tipping fee differential to encourage the source separation of yard waste. Though disposal fees for source separated yard waste will be less than that for normal refuse, City efforts to promote backyard composting will ultimately reduce disposal fees funded through refuse collection rates.

Awards and Public Recognition Program

This alternative has been selected for implementation in the short-term planning period and will focus on source reduction, recycling, and composting programs developed and maintained through private business efforts. The City will work with the Woodland Chamber of Commerce to seek proper venues to call attention to local businesses. Press releases will also be provided to local newspapers to highlight Woodland business efforts.

Government Non-Procurement Source Reduction Policies

This alternative has been selected for implementation in the short-term planning period and will target materials in the municipal government waste stream. The primary goal will be to improve efficiency in the use of office paper and other products or materials utilized by the City. Through this alternative the City will provide an example of source reduction policies and efforts to residential and commercial/industrial waste generators.

Government Procurement Policies

During the short-term planning period the City will develop a procurement policy which will consider product durability, recyclability, recycled material content and potential environmental impacts of materials currently utilized in City operations. This procurement policy will also be promoted as an example to local businesses as to how they can reduce the quantity and toxicity of wastes currently disposed.

Recycling Programs

The City has recently expanded a residential curbside collection program to all single family and several multi-family residences in the jurisdiction. In an effort to provide for greater levels of diversion through recycling activities, the City will also facilitate current commercial/industrial recycling programs through program promotion and technical assistance and, through participation in regional integrated waste management programs, take advantage of County regional processing facilities planned for the short and medium-term planning periods. Summarized below are the recycling programs selected for implementation by the City.

Residential Curbside Collection Program Expansion

This program has been selected as a contingency alternative should the City fall short in meeting its diversion goals. Program expansion of current curbside services to all multi-family dwellings is limited by the fact that dwellings greater than 5 units in size are dispersed throughout the City and that a significant percentage of these buildings lack sufficient space to site additional collection containers.

In an effort to facilitate curbside collection of residential dwellings greater than 4 units in size,

the City is planning to review building code requirements in the short-term planning period to allow for addition storage space for locating refuse and recyclable material collection containers.

Expansion of curbside collection to all residential units in the City may be implemented in the medium-term planning period depending on the levels of waste diversion achieved through other waste management programs.

Increased Commercial/Industrial Collection Programs

This alternative has been selected for implementation in the short-term planning period. Through this alternative, the City's recycling coordinator will facilitate commercial/industrial waste diversion through program promotion and in-person contact with prospective Woodland businesses. The recycling coordinator, in conjunction with the franchised waste hauler, will facilitate the development of company in-house programs; however, site specific program development will ultimately be the responsibility of the hauler.

Commercial/industrial recycling programs will likely target materials with readily available markets. Material types to be targeted will include restaurant and bar glass, cardboard, and high-grade paper. Other materials may be targeted on a site specific basis.

The hauler will also be directed to collect restaurant and other food-waste-refuse separately for disposal at YCCL. This will result in a reduction of material contamination in mixed waste loads and will facilitate waste recovery at the County materials recovery facility proposed for the medium-term planning period.

Automated Material Recovery Facility

This alternative has been selected by the City for implementation in the medium-term planning period in a cooperative integrated waste management effort with Yolo County and the Cities of West Sacramento and Winters. Through this alternative, the City of Woodland has committed non-source separated commercial/industrial wastes to be diverted to the County materials recovery facility proposed for development in the medium-term planning period.

A feasibility study is scheduled to be undertaken in 1992 by the Yolo County Department of Public Works and Transportation to determine facility parameters, economics, and targeted waste streams for the proposed facility. At this time, policy issues will be developed to determine the County's role in facility ownership, operation, and waste flow controls. Construction of the facility is not expected to take place until 1996. The cost of development, construction, and operation of the facility will be funded through the County Sanitation Enterprise Fund.

Specific waste types to be targeted at the facility will be determined based on available markets, market specifications, and material availability.

## Composting Programs

The City of Woodland does not have a composting program for yard waste currently disposed; however, the City does have a very successful source separated yard waste collection program for all single family and several multi-family dwellings in the City. In conjunction with the residential collection program, the City will also provide for the collection of yard waste generated from the commercial/industrial waste sectors through a separate bin service program. The City will also participate in the County's regional composting program to take advantage of economies of scale and to provide for regional compost marketing efforts. These programs are briefly summarized below.

### Continue Existing Curbside

The City currently offers separate residential curbside collection of yard waste on normal refuse collection days. The collection program targets leaves, grass, and tree and shrub prunings generated by residents of single family and several multi-family dwellings in the City. Yard waste is accumulated into piles on the street and collected weekly by Waste Management of Woodland using a claw-equipped front loader and a packer truck with follow-up street sweeping. The material collected is disposed of at the YCCL. This program has been very successful in the collection of yard waste and will continue through the short and medium-term planning periods. The program is funded through refuse collection fees.

### Provide Commercial/Industrial Collection

Based on the Solid Waste Generation Study, the quantity of yard waste generated from the commercial/industrial waste sector is approximately 2,600 tons annually or 3 percent of all waste generated. In an effort to maximize the quantity of waste diverted and to provide commercial/industrial businesses the opportunity to participate in yard waste diversion programs, the City has selected a source separated yard waste collection program for the commercial/industrial waste sectors. Bins will be provided for specified businesses in the City which generate significant quantities of yard waste for diversion. The bins will be serviced on a weekly basis by the franchised waste hauler and yard waste will be brought to the YCCL composting facility.

This program will be implemented by Waste Management of Woodland during the short-term planning period with promotion assistance from the City. Funding for this service will be provided through the commercial/industrial refuse collection fees.

### Centralized Regional Composting Site

Through this alternative, the City will divert source separated collected yard waste to a regional composting facility at YCCL. This alternative will be implemented in the short-term planning period due to the lower costs associated with the expansion of the existing YCCL composting

operation. This existing operation provides the City the opportunity to achieve maximum diversion levels and also the ability to participate in cooperative regional marketing efforts. Expansion of the existing facility is expected to take place in 1992. Yard waste diversion for the City is expected to take place during the 4th quarter of 1992.

### Special Waste Programs

In keeping with the City's policy to participate in regional County integrated waste management programs, the City will participate in the County's Self-Haul Bin Transfer Operations as well as support County efforts to promote and/or require that asphalt and concrete be source separated prior to disposal at YCCL. These programs are briefly described below.

#### Self-Haul Bin Transfer Operations

The YCCL is currently in the process of developing a "Self-Haul Bin Transfer Operation" recovering white goods, wood waste, yard waste and other materials in sufficient quantity to target for diversion. The operation is scheduled to commence during the 4th quarter of 1992. Through this alternative the City will promote the use of this facility and encourage residents of Woodland to divert white goods and other wastes not targeted through current diversion programs though this recovery operation.

#### Concrete and Asphalt Recycling

Through this alternative the City will promote the source separation of inert wastes through public education efforts. Promotions may be in the form of brochures or in-person contact targeting construction/demolition companies doing work in the City of Woodland. The City will also support County efforts in the development of an ordinance to mandate source separation of inert and other wastes. The City will also assist the County in regional market development efforts and will consider revising current City construction specifications requiring percentages of recovered asphalt/concrete materials for new construction.

### Education and Public Information Programs

To facilitate the selected waste management programs, the City has identified the following education and public information efforts to maximize levels of waste diversion. The combined focus of these programs will target all waste generators in the City. These programs are briefly summarized below.

#### Residential Sector Promotional Campaign

Residential instruction/information brochures will be developed stressing source reduction, recycling, composting, and other waste diversion programs taking place in the City. They will be distributed to every applicable residence and utilized at community events to promote City

programs. These brochures will also serve as handouts at presentations to service clubs and civic organizations prior to and after the recycling programs are implemented.

Commercial/Industrial Programs

As part of the expanded commercial/industrial recycling program, the City recycling coordinator will assist the franchised waste hauler in the design, development, and implementation of the specific business recycling programs in the City. As individual programs are developed, the City will provide back-up support in the form of source reduction and recycling information materials and suggested implementation plans.

School Curriculum

In cooperation with Woodland Unified School District, the City will assist in the implementation of specific educational programs for all elementary grades (K-6). Although packaged programs are available from the CIWMB and other sources, materials may be adapted to focus on Woodland's specific recycling programs. The City recycling coordinator and school district officials will seek a co-sponsor to participate with the City and/or School District by purchasing and/or offsetting some of the expenses associated with this program.

School Tours

In cooperation with the Yolo County Department of Public Works and the City's franchised waste hauler, tours will be arranged to provide students the opportunity to visit the YCCL and the Waste Management material processing facilities. Additional student tours may also be arranged with local businesses and institutions which have special recycling programs or process recycled materials.

Business Recognition Program

The City, in cooperation with the Woodland Chamber of Commerce or other business organizations, will establish recycling and source reduction recognition events. A full spectrum of awards can be presented to those firms establishing recycling and source reduction programs with special acknowledgements going to major diversion efforts or other significant achievements.

Media Advertising & Releases

The City will purchase advertising space in the Daily Democrat to show the progress and success of the various recycling and source reduction programs. A quarterly update report on waste diversion activities will be made available to local newspapers to increase awareness of recycling programs and the City's progress towards meeting diversion goals.

In addition to the paid advertising campaign, the City will produce and transmit appropriate releases to all media throughout the Woodland area regarding the various aspects of the recycling and source reduction programs. These releases will be targeted towards new programs and to serve as reminders on how to participate in ongoing waste diversion alternatives.

Community Events

The City will also take part in promoting diversion programs at community events and other local activities such as the County Fair and Cruise Night. In most cases promotional information will be offered to attendees.

## PROGRAM FUNDING

The City of Woodland has an exclusive long-term franchise agreement with Waste Management of Woodland (WMW) for the collection and removal of all municipal solid waste generated from sources within the City. Refuse collection services also include the separate collection of residential yard waste at curbside, street sweeping, and other collection services in the City. These services are funded through refuse service fees which are adjusted annually based on the annual percentage increases in the Consumer Price Index (CPI). In the event that increases in landfill disposal fees exceed the CPI, service rates are adjusted by service category based on corresponding waste volume criteria for the incremental disposal cost difference.

Recycling services provided by WMW include residential curbside and commercial collection programs. The residential curbside collection program is currently funded through a monthly fee of $0.94 per household which is subject to an annual adjustment based on the CPI. An additional "recycling activity" fee of $0.70 per household and $0.25 per cubic yard are assessed to residential and commercial accounts respectively to fund public education, coordination, and other miscellaneous costs associated with the City's recycling programs. Approximately $60,000 is generated annually through the activity fees.

### Estimated Program Costs

The City's integrated waste management plan will be funded through "recycling activity" fees, refuse collection rates, and landfill tipping fees. Program implementation costs for the City are expected to result from staffing and coordination efforts by City personnel, a feasibility study to evaluate the implementation of a variable refuse collection rate structure, and expenditures for public information and education materials. These expenses will be funded through the City's recycling activities fees and are summarized in Table 10-1. Assuming that approximately $60,000 is available annually for program implementation, a shortfall in available funding is indicated in Table 10-1 for years 1993 and 1995. Program fees will be adjusted accordingly to account for these program expenses.

Table 1-1. Estimates of City Funding Requirements

| Program | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|
| Variable Rate Evaluation | --- | --- | $30,000 | --- | $21,000* |
| Backyard Composting | --- | $7,500 | --- | $7,500 | --- |
| Education and Public Information | --- | $21,000 | $24,500 | $24,300 | $17,000 |
| City Staffing Requirements | --- | $19,000 | $43,000 | $30,000 | $29,000 |
| Total | --- | $47,500 | $105,000 | $61,800 | $67,000 |

* This cost is contingent on the City's decision to implement a variable refuse collection rate structure.

Expansion and development of commercial material recovery programs in the City will require funding for capital expenditures and operations and maintenance costs which will be the responsibility of the franchised waste hauler. These programs will be funded through increased commercial refuse service fees which will be adjusted accordingly.

Development of regional processing facilities will be funded by the Yolo County Department of Public Works and Transportation through the County Sanitation Enterprise Fund (CSEF). County refuse disposal fees will be adjusted accordingly to increase revenues to the fund. The County will also consider bond issuance as a means of financing recovery facilities should there be a shortfall in funds.

Table 1-2 summarizes City staffing requirements for program implementation and monitoring. Table 1-3 summarizes program capital expenditures and operations and maintenance costs for the selected programs.

Table 1-2. Projected City Labor Requirements (hours) to Meet the Program Implementation Goals

| Program | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|
| **Source Reduction** | | | | | |
| Determine Existing Conditions | --- | --- | 120 | 40 | 40 |
| Variable Rate Evaluation | --- | --- | --- | --- | --- |
| Backyard Composting | --- | --- | 208 - 248 | 128 | 128 |
| Awards and Recognition Program | --- | --- | 66 | 46 | 46 |
| Non-Procurement Program | --- | --- | 80 - 120 | 50 | 50 |
| City Procurement Guidelines | --- | --- | 220 - 240 | 20 - 40 | 20 - 40 |
| Total Source Reduction | --- | --- | 694 - 794 | 284 - 304 | 284 - 304 |
| **Recycling** | | | | | |
| Commercial/Industrial Recycling Expansion | --- | 320 | 780 | 780 | 780 |
| Commercial/Industrial Waste Diversion Through County MRF | --- | --- | --- | --- | --- |
| Total Recycling | --- | 320 | 780 | 780 | 780 |
| **Composting** | | | | | |
| Residential Yard Waste Collection (1) | --- | --- | --- | --- | --- |
| Commercial/Industrial Yard Waste Collection | --- | 120 | 140 | 40 | 40 |
| Total Composting | --- | 120 | 140 | 40 | 40 |
| **Special Waste** | | | | | |
| Self-Haul Bin Transfer | --- | --- | --- | --- | --- |
| Concrete/Asphalt Recycling | --- | 60 | 180 | 60 | 60 |
| Total Special Waste | --- | 60 | 180 | 60 | 60 |
| **Education** | | | | | |
| Collateral Material Development | --- | 145 | 145 | 145 | 145 |
| Commercial/Industrial Business Program | --- | 120 | 80 | 80 | 80 |
| School Curriculum | --- | 80 | 140 | 20 | 20 |
| Media Advertising/Releases | --- | 170 | 170 | 170 | 170 |
| Community Events | --- | 110 | 110 | 110 | 110 |
| Total Education | --- | 625 | 645 | 525 | 525 |
| Total City Staffing Requirements | --- | 1,125 | 2,439 - 2,539 | 1,689 | 1,689 - 1,709 |

(1) Implementation of the County MRF facility is expected to take place in the medium-term planning period.

(2) The current residential yard waste collection program is not expected to require any addition revenue or staffing to continue the program as is.

Table 1-3. Projected Funding Requirements to Meet Program Implementation Goals

| Program | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|
| **Source Reduction** | | | | | |
| Determine Existing Conditions | --- | --- | --- | --- | --- |
| Variable Rate Evaluation | --- | --- | $30,000 | --- | $21,500 |
| Backyard Composting | --- | $7,500 | --- | $7,500 | --- |
| Awards and Recognition Program | --- | --- | --- | --- | --- |
| Non-Procurement Program | --- | --- | --- | --- | --- |
| City Procurement Guidelines | --- | --- | --- | --- | --- |
| Total Source Reduction (1) | --- | $7,500 | $30,000 | $7,500 | $21,500 |
| **Recycling** | | | | | |
| Commercial/Industrial Recycling Expansion | --- | --- | --- | --- | --- |
| Commercial/Industrial Waste Diversion Through County MRF | --- | --- | --- | --- | --- |
| Total Recycling | --- | --- | --- | --- | --- |
| **Composting** | | | | | |
| Residential Yard Waste Collection | --- | --- | --- | --- | --- |
| Commercial/Industrial Yard Waste Collection (2) | --- | --- | $30,000 | $64,000 | $184,000 |
| Total Composting (2) | --- | --- | $30,000 | $64,000 | $184,000 |
| **Special Waste** | | | | | |
| Self-Haul Bin Transfer (3) | --- | $245,000 | $125,000 | $125,000 | $125,000 |
| Concrete/Asphalt Recycling | --- | --- | --- | --- | --- |
| Total Special Waste (3) | --- | $245,000 | $125,000 | $125,000 | $125,000 |
| **Education** | | | | | |
| Collateral Material Development | --- | $8,000 | $2,500 | $9,800 | --- |
| Commercial/Industrial Business Program | --- | $2,500 | --- | $2,500 | --- |
| School Curriculum | --- | --- | $11,000 | $1,000 | $6,000 |
| Media Advertising/Releases | --- | $10,000 | $10,000 | $10,000 | $10,000 |
| Community Events | --- | $1,000 | $1,000 | $1,000 | $1,000 |
| Total Education | --- | $21,500 | $24,500 | $24,300 | $17,000 |
| Total Funding Requirements | --- | $274,000 | $209,500 | $220,800 | $347,500 |

(1) Programs to be funded through the City's "recycling activities" fees.
(2) Funding is provided through commercial refuse collection fees.
(3) Costs associated with the development of the Self-Haul Bin Transfer Facility will be funded through YCCL tipping fees.

## WASTE DIVERSION PROJECTIONS THROUGH SRRE IMPLEMENTATION

Table 1-4 illustrates how each program contributes to meet the City's waste diversion goals in the short and medium-term planning periods. Diversion estimates for most source reduction programs have not been provided due to the difficulty in quantifying diversion levels for each individual program.

# Table 1-4. Diversion Rate Projections (percent)

| Program | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Source Reduction Diversion Programs** | | | | | | | | | | |
| Existing Conditions | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| Quantity Based Variable Rates | | | | | | | | | | |
| Backyard Composting | | | 0.7 | 0.1 | 1.0 | 1.4 | 1.4 | 1.5 | 1.5 | 1.5 |
| Awards and Recognition | | | | | | | | | | |
| Non-procurement | | | | | | | | | | |
| Government Procurement policies | | | | | | | | | | |
| Total Source Reduction | 0.07 | 0.07 | 0.77 | 0.17 | 1.07 | 1.47 | 1.47 | 1.57 | 1.57 | 1.57 |
| **Recycling Diversion Programs** | | | | | | | | | | |
| Existing Recycling | 17.9 | 17.9 | 17.8 | 17.8 | 17.8 | 17.8 | 17.7 | 17.7 | 17.7 | 17.7 |
| Existing Curbside | | 1.32 | 1.52 | 1.83 | 1.83 | 1.83 | 1.83 | 1.83 | 1.83 | 1.83 |
| Expanded Commercial/Industrial Recycling | | | 1.7 | 3.2 | 4.7 | 5.5 | 6.0 | 6.0 | 6.0 | 6.0 |
| Automated Material Recovery | | | | | | | 4.1 | 8.1 | 12.2 | 15.3 |
| Existing Transformation | | | | | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 |
| Total Recycling | 17.90 | 19.22 | 21.02 | 22.83 | 24.33 | 26.73 | 31.23 | 35.23 | 39.33 | 42.43 |
| **Composting Diversion Programs** | | | | | | | | | | |
| Curbside Yard Waste Collection | | | 11.4 | 10.9 | 10.9 | 10.8 | 10.6 | 10.6 | 10.6 | 10.6 |
| Commercial/Industrial Collection | | | 0.2 | 0.4 | 1.2 | 1.4 | 1.6 | 1.6 | 1.6 | 1.6 |
| Total Composting | — | — | 11.60 | 11.30 | 12.10 | 12.20 | 12.20 | 12.20 | 12.20 | 12.20 |
| **Special Waste Diversion Programs** | | | | | | | | | | |
| Self-Haul Bin Transfer Operations | | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 |
| Concrete/Asphalt Recycling | | 1.0 | 1.4 | 1.7 | 1.7 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 |
| Total Special Waste | — | 3.70 | 4.10 | 4.40 | 4.40 | 5.30 | 5.30 | 5.30 | 5.30 | 5.30 |
| TOTAL DIVERSION | 17.97 | 22.99 | 37.49 | 38.70 | 41.90 | 45.70 | 50.20 | 54.30 | 58.40 | 61.50 |

# SECTION 2

# OVERVIEW

## 2.1 INTEGRATED WASTE MANAGEMENT ACT (AB 939)

The amount of solid waste generated in California, coupled with diminishing landfill space and potential adverse environmental impacts from landfilling, created an urgent need for state and local agencies to enact and implement an aggressive new integrated waste management program called Assembly Bill 939 (AB 939), the California Integrated Waste Management Act of 1989. The goals of AB 939 are to:

- Have local governments develop and implement integrated waste management programs tailored to their individual needs.
- Increase the diversion of waste material from landfill disposal through source reduction, recycling, and composting.
- Ensure the efficient use of existing solid waste landfills.
- Ensure that new solid waste landfills are considered in light of quantitative information generated by solid waste characterization studies.

### 2.1.1 Requirements

AB 939 requires both city and county governments to develop and implement solid waste management plans covering a 15-year projected period (through 2005). AB 939 also establishes both guidelines and deadlines for the required documents.

AB 939 requires that each incorporated city and county develop a plan that demonstrates how the jurisdiction will divert 25 percent of all solid waste from landfill disposal and transformation by 1995 and 50 percent by the year 2000. This planning document is called a Source Reduction and Recycling Element (SRRE) and must be prepared in accordance with California Public Resources Code Sections 40900 et seq.

In addition, each county is required to develop a siting element and county-wide Integrated Waste Management Plan (IWMP). The Siting element shall provide information documenting that the County has a minimum of 15 years of combined permitted disposal capacity. If the County cannot meet the required 15 year minimum permitted disposal capacity, then the Siting Element shall identify solid waste management strategies for the transformation of disposal of excess solid waste. The Siting Element shall also provide some detailed information concerning the existing solid waste disposal facilities as well as any plans for expansions that may be necessary to meet the State's requirements for this element.

The County's IWMP shall consist of all the cities' SRRE's and Household Hazardous Waste Elements (HHWE's) prepared and submitted to the County; the County's SRRE and HHWE; a summary of the County's significant waste management issues and problems; and the County-wide Siting Element.

### 2.1.2 Approval Process

The process by which the Source Reduction Recycling Element is approved by the local jurisdiction ensures opportunity for public comment. Approval of the preliminary draft by the jurisdiction must be at a public hearing that is advertised in the local paper at least thirty days in advance of the hearing. The approved Preliminary Draft Source Reduction Recycling Element is then circulated for a review period of 45 days to the State, County Local Task Force (LTF), and neighboring jurisdictions.

Following the comment period for the preliminary draft element, the final draft element is then prepared which addresses all comments received. This draft is then circulated for a 15 day period for review and comment by the LTF. A public hearing must also be advertised at least 30 days in advance of the date at which time the local jurisdiction will approve the final draft element with changes per the comments received.

After each jurisdiction has approved and submitted their Source Reduction Recycling Element to the County, the County Board of Supervisors must hold a public hearing to approve the Integrated Waste Management Plan for the County. This document incorporates all the local jurisdictions' elements with the County's plan for the unincorporated area. When approved, it is submitted to the State of California Integrated Waste Management Board for approval.

The California Integrated Waste Management Board will review each city and the county's plan for the unincorporated area. The California Integrated Waste Management Board has 120 days from the date of receipt to approve or disapprove the plans. A notice of disapproval will include specific recommendations for correction.

### 2.1.3 Enforcement

At least every two years the CIWMB will review each city/county SRRE and hold a public hearing in the local agency's jurisdiction (when possible). If the CIWMB determines that the city/county has failed to implement the programs and achieve the required diversion rates, the Board will issue an order of compliance with specific deadlines. Failure to comply can result in daily fines of up to $10,000 being imposed by the State.

### 2.1.4 Revision Process

After approval of the Final Source Reduction Recycling Element by both the local jurisdiction and the State Board, the jurisdiction shall monitor the programs to be implemented in the

element to document the amount of waste reduced as a result of the element. An annual report summarizing the jurisdiction's progress toward achieving the mandated goals shall be submitted to the State Board. This report shall serve as the basis for determining if revisions to the adopted element are necessary.

The annual report shall be submitted within 90 days of the anniversary date the Board approved the element. The contents of the annual report shall be based on data gathered during the year following the SRRE's adoption, or the most recent revision by the Board.

If, in the process of implementing the adopted Source Reduction Recycling Element the jurisdiction finds it necessary to revise the element, this may be done during or prior to the annual review of the SRRE. All revisions to the adopted SRRE must be submitted to the State Board for approval. Requests for revisions must address the reasons for the revisions. These may include:

- Monitoring of programs finds targeted materials are not being diverted from the waste in the quantities originally projected.
- Demographics of jurisdiction have changed, altering the waste stream.
- Data base used for adopted SRRE is found to be inaccurate.
- Implementation of programs/facilities cited in SRRE are delayed due to permitting, and/or funding.

Revisions to the adopted SRRE must be approved by the same process as adoption of the SRRE, as described in Section 2.1.2, Approval Process, above.

# SECTION 3

## WASTE CHARACTERIZATION COMPONENT

As specified in Section 18722(a) of the California Code of Regulations (CCR), each jurisdiction must prepare an Initial Solid Waste Generation Study which provides data to allow a jurisdiction to fully understand, in quantifiable terms, its current solid waste disposal and diversion practices, as well as forecast future solid waste generation rates. This information is then used as the basis for planning all future waste handling, disposal, and diversion programs and is used throughout this SRRE. This Solid Waste Characterization Component presents the findings of the Solid Waste Generation Study that was performed by EBA Wastechnologies in the Spring and Summer of 1991. The study was completed as a part of a regional study that included the Cities of Davis, Woodland, West Sacramento and Winters, as well as the unincorporated area of Yolo County. The study was performed in accordance with the requirements presented in Section 18724 of the CCR.

The Waste Generation Study characterizes the waste which is generated from residential, commercial, industrial, and other waste sources in the City. For the purpose of this study, waste generated from the above sources is defined as follows:

- Residential solid waste - waste originating from single-family and multi-family dwellings, condominiums, and other residential sources.
- Commercial solid waste - waste originating from retail businesses, offices, warehouses, distribution centers, etc.
- Industrial solid waste - waste originating from manufacturing facilities and construction and demolition companies.

As required by AB 939, the Waste Generation Study includes the following elements:

- Waste Disposal Characterization
- Waste Diversion Characterization
- 15-year Waste Generation Projection

The Waste Disposal Characterization provides estimates of the composition and quantity of solid waste disposed of annually. The quantities of waste disposed of are reported both in terms of weight and landfill in-place volume estimates. The Waste Diversion Characterization provides estimates of the composition and quantity of solid waste currently being diverted (recycled, composted, and transformed) from each jurisdiction. The quantity of waste which is diverted can be applied to the overall waste diversion goals of 25 and 50 percent. Only those wastes

which are normally disposed of at permitted solid waste disposal facilities can be included. Waste diverted to transformation (incineration) facilities is not applicable to the short-term 25 percent goal, but may account for up to 10 percent of the medium-term 50 percent diversion goal.

The 15-year Waste Generation Projections are based on the quantities of waste which are currently disposed of and diverted from the waste stream. Rates of waste disposal and diversion projections are projected for the next 15 years based on available planning data for the jurisdictions. The waste projections also estimate the quantity of waste which must be diverted to comply with the 25 and 50 percent diversion goals.

## 3.1 SUMMARY OF CURRENT CONDITIONS

As shown in Table 3-1, the results of the study conclude that the City of Woodland currently generates solid waste at a rate of 84,557 tons per year. Of that amount, approximately 20.6 percent of the material (17,388 tons per year) is being recycled, reused, or composted. The remaining 79.4 percent (67,169 tons per year) is being landfilled in the Yolo County Central landfill (YCCL).

**Table 3-1. Summary of Current Solid Waste Disposal, Diversion and Generation Rates**

| Waste Type (Major Categories) | Disposed * (tons per year) | Diverted * (tons per year) | Total Generated (tons per year) | Diversion Rate (% of total waste generated) |
|---|---|---|---|---|
| Paper | 16,793 | 2,428 | 19,221 | 2.87 |
| Plastic | 5,293 | 26 | 5,319 | 0.03 |
| Glass | 1,411 | 707 | 2,118 | 0.84 |
| Metal | 3,656 | 443 | 4,099 | 0.52 |
| Yard Waste | 13,416 | 0 | 13,416 | 0.00 |
| Other Organic Waste | 12,982 | 2,296 | 15,278 | 2.72 |
| Other Non-Organic Waste | 10,784 | 11,487 | 22,271 | 13.59 |
| Special Waste | 2,832 | 0 | 2,832 | 0.00 |
| Total | 67,169 | 17,388 | 84,554 | 20.57 |

* Numbers may not add up exactly due to rounding.

It should be noted that most of the City's current diversion comes from the recycling of inert solids such as concrete and asphalt, included as "Other Non-Organic Waste" in Table 3-1 (representing a 13.6 percent diversion rate). This material is used at the YCCL as wet weather decking for waste disposal operations. Consideration is currently being given by State Legislature to eliminate some of these materials from inclusion in the diversion rate calculation. If such a change were to occur, the City's diversion rate might be reduced by as much as 13.6 percent, bringing current diversion to approximately 7 percent.

## 3.2 BACKGROUND INFORMATION

### 3.2.1 Demographic Profile for Yolo County

The City of Woodland is one of four incorporated cities located within Yolo County. The following information was obtained from the Yolo County Population and Housing Estimates published by the California Department of Finance Demographic Research Unit, April 26, 1990. Population and housing estimates for each jurisdiction are summarized in Tables 3-2 and 3-3.

Table 3-2. Population Characterization By Jurisdiction

| Jurisdiction | 1980 | 1990 | Percent Change | Annual Growth Rate |
|---|---|---|---|---|
| Davis | 36,640 | 45,310 | 23.7 | 1.53 |
| West Sacramento | 0 | 27,331 | - | 0.07* |
| Winters | 2,652 | 4,545 | 71.4 | 10.05 |
| Woodland | 30,235 | 39,797 | 31.6 | 3.54 |
| Unincorporated Area | 43,847 | 22,193 | 50.6 | - 1.81* |
| County Total | 113,374 | 139,176 | 22.8 | 2.23 |

* Prior to January 1, 1987, West Sacramento was part of the unincorporated area of Yolo County. This accounts for the small or negative annual growth rates reported.

Table 3-3. Housing Characteristics by Jurisdiction

| Jurisdiction | Single Family | 2 to 4 Units | 5 Plus Units | Mobile Homes | Percent MFD* (5+) |
|---|---|---|---|---|---|
| Davis | 9,282 | 1,752 | 6,741 | 373 | 37 |
| West Sacramento | 6,981 | 851 | 2,558 | 1,555 | 21 |
| Winters | 1,243 | 142 | 195 | 59 | 12 |
| Woodland | 9,482 | 1,010 | 3,794 | 649 | 25 |
| Unincorporated Area | 4,445 | 366 | 1,136 | 375 | 18 |
| County Total | 31,433 | 4,121 | 14,424 | 3,011 | -- |

* MFD - Multi-family Dwellings

### 3.2.2 Current Waste Handling Practices

The City of Woodland contracts for collection services with Woodland Disposal Company. Refuse collection services and service fee structures include the following:

- Collection services for single-family dwellings are provided once each week using automated refuse collection vehicles for toter collection routes. Only a few households currently receive regular can collection service. Collection fees for toter collection service are $6.70 per month for 64-gallon containers (or a single can) and $11.49 per month for 101-gallon containers (or two cans).

- Bin service for multi-family units and commercial businesses is provided at least once each week or as frequently as necessary. Roll-off containers and bins are provided for large commercial waste generators. Service fees for bin collection are based on a cost per yard per month. This cost per yard decreases as the bin size and frequency of service increases. Service fees for large bins (10- to 50-cubic yards) are based on a cost per yard factor which does not vary with the size of the container used. Commercial accounts which utilize compactors for waste disposal are charge a rate based on the size of the container used.

- City-wide cleanup programs are offered to City residents on an annual basis. Items targeted for collection include general household waste, furniture, and appliances.

- Noncontainerized refuse is limited to street pickup of leaves, grass clippings, and tree and shrub prunings. Street pickup is performed with a claw-equipped front loader and packer trucks with follow-up street sweeping. Fees charged for the

separate collection of yard waste are based on the size of the residential lot or on a per unit basis. Yard waste collection fees are summarized in Table 2-3.

All refuse collected is considered to be the property of the City upon being placed at the curb or in the bin for collection. This ownership is transferred to the hauler once the refuse is collected. All waste which is not recycled is then transported to YCCL.

### 3.2.3 Current Waste Diversion Programs

Waste diversion programs identified to be operating in the City include the following:

Curbside Collection

A curbside collection program has recently been expanded to all single family and several multi-family households in the City. Materials collected include newspapers, recyclable glass containers, PET, HDPE, and aluminum and bi-metal cans. This service is offered on a weekly basis on the day of normal refuse collection.

Private Sector Recycling

Private sector commercial and industrial recycling has been identified in the City through a recycling survey conducted in conjunction with the SWGS. Four certified recycling centers are also located in the City.

Commercial/Industrial Recycling

Commercial and industrial recycling is also provided by Waste Management of Woodland. These private sector programs target corrugated cardboard and metals diverting approximately 600 TPY and 100 TPY respectively.

Non-Profit Recycling

Bi-monthly collection of newspaper is conducted by Masonic Youth and the Holey Rosary non-profit organizations.

In addition to the above on-going diversion programs, an anti-scavaging ordinance has recently been developed and adopted by the City to facilitate curbside recycling. Elements of the ordinance include the following:

- Establishes the ownership of the recyclable materials and recycling containers;
- Lists prohibited acts which includes not only taking of materials but also littering, destruction of materials, and material contamination;

- Identifies civil actions against violators; and
- Allows for non-profit groups to raise money by collecting and selling recyclable materials on a case by case basis.

## 3.3 WASTE DISPOSAL CHARACTERIZATION

This section summarizes the project approach and presents the quantity and composition of wastes disposed of from residential, commercial, and industrial waste sources for the City of Woodland.

### 3.3.1 Project Approach

The estimated quantities of waste disposed of from residential, commercial, and industrial waste sources were based on information obtained from waste haulers servicing the individual cities, field data obtained through sampling, and annual tonnage disposal information obtained from YCCL waste disposal data.

Waste composition for the different waste sources in the City were estimated through a combination of field sampling at the point of generation for residential single-family units and sampling and visual characterization at the point of disposal for commercial, industrial, residential multi-family, and other waste sources.

The following summary of the methodology used to estimate the quantity and composition of waste generated and disposed of from the study jurisdictions.

#### 3.3.1.1 Waste Quantity

Sources and methods for estimating the quantity of waste generated from residential, commercial, industrial, and other waste sources are summarized below.

Residential Sources

The quantity of waste disposed of from single-family dwellings (SFD) for the City was based on household waste generation rates estimated through field sampling and Yolo County waste disposal data for the year 1990.

The average waste generation rate for multi-family dwellings in the City of Woodland was based on available hauler data for April 1990. The average disposal rate per unit per week was estimated to be 38 pounds.

Commercial, Industrial, and Institutional Sources

The quantity of waste disposed of from commercial, industrial, and institutional sources for the City was based on available information obtained from the contract waste hauler servicing the City, and YCCL waste disposal records.

In addition to individual hauler disposal data for each City, the County maintains records of the quantity of waste disposed of from companies that haul their own waste to the landfill. This data is referred to as "nonaccount" waste disposal data. The quantity of waste disposed of from nonaccount waste generators was allocated to jurisdictions based on the City where each company is located. Approximately 20 percent of these companies consist of construction and demolition firms which generated up to 70 percent of the nonaccount waste disposed of during 1990. It is likely that some of the waste generated by these construction/demolition firms did not originate from the jurisdictions they are located in; however, information is not available on its source.

Self-Haul Sources

Approximately 7 percent of the waste disposed of in Yolo County is from self-haul sources. Self-haul sources consist of individuals who haul their own waste utilizing pick-up trucks, automobiles, and small trailers. A study recently conducted by YCCL estimates the average quantity of waste disposed of per self-haul vehicle to be 644 pounds. During the waste sampling period, approximately 1,500 individuals hauling their own waste to the landfill were surveyed by YCCL personnel to identify the jurisdiction they were from. Based on the above information and the total number of self-haul vehicles which disposed of waste in 1990, the quantity of self-haul waste disposed of from each jurisdiction was estimated.

Estimates of Waste Disposed (by volume)

Estimates of the volume of waste disposed of from each jurisdiction were based on an in-place landfill density study recently conducted by the YCCL. Estimates for in-place density were approximately 1,200 pounds per cubic yard. This value was applied to the quantity of waste disposed (by weight) for each jurisdiction to arrive at disposed volume estimates.

### 3.3.1.2 Waste Composition

The number of samples obtained for each jurisdiction during the field sampling program was based on the following:

- The formula for normal approximation as defined in "Sample Weights in Solid Waste Composition Studies," A. L. Klee and D. Carruth, American Society of Civil Engineers, Journal of the Sanitary Engineering Division, Volume 96, August 1970.

- Quantity and availability of waste disposed of from waste generation sources.

Using the formula for normal approximation, the number of samples to be taken is based on the waste type which is expected to contribute the largest percentage of material to the overall waste composition. Assuming a maximum percentage composition value of 35 percent, what normally would be expected for waste paper, the number of samples necessary for statistically valid sampling with corresponding levels of precision are as follows:

| Number of Samples | Precision Level (+/- percent) |
|---|---|
| 19 | 3 |
| 7 | 5 |
| 2 | 10 |

Sources of information and methods for estimating the composition of waste disposed of from residential, commercial, industrial, and other waste sources are summarized below.

Residential Waste Sources

Residential sources of waste generation included single-family and multi-family dwellings for each jurisdiction and the Unincorporated Area as well as low income housing and dormitories located at UC Davis.

Single Family Dwellings Waste Composition--

A total of 147 residential samples were obtained from SFDs from the study jurisdictions. Samples were obtained at random from areas within each City identified as being low, medium, and high income areas. The waste generated from one household was considered to be a single sample. Collected samples were transported to YCCL for sorting.

The residential samples collected from the Cities of West Sacramento, Winters, and Woodland (109 samples) were combined for statistical analysis to arrive at an estimate of the percent of Household Hazardous Waste (HHW) generated on a regional basis. This value, 0.7 percent, was then used to estimate the quantity of HHW disposed of from the above jurisdictions. The waste composition for SFDs for each City was readjusted to account for the change in the HHW percent value. Recorded weights for HHW included the weight of the container.

Residential waste disposed of from the Unincorporated Area of the County was sampled at the point of disposal. A total of 5 samples averaging 242 pounds were obtained. Based on an average pounds per household rate of 45 pounds per week, the equivalent of 27 households were sampled.

Multi-family Dwelling Waste Composition--

A total of 6 samples, averaging 218 pounds, were obtained at the point of disposal (YCCL) from the Cities of Winters and Woodland. These samples were combined for statistical analysis and the composition was considered as being representative for MFDs in the Cities of Winters, Woodland, West Sacramento, and the Unincorporated Area.

Six MFD samples, averaging 244 pounds, were obtained from the City of Davis. The City of Davis offers curbside recycling to MFDs in the City; therefore, these samples were not combined with the regional composition sample grouping.

Residential Waste from the University of California at Davis--

U.C. Davis Physical Plant Operations established special collection routes to facilitate the process of obtaining representative samples of the different types of waste generators on the campus. Two samples of residential waste were obtained; one from campus dormitories and another from low income residential housing.

Commercial/Industrial/Institutional Waste Sources

A total of 94 samples were obtained from commercial, industrial, and institutional sources. The majority of commercial and industrial samples were selected at random at the point of disposal. Samples from roll-off loads were obtained from sections of the discarded loads identified by the field supervisor to be representative of the load. Samples from front-end refuse collection vehicles were obtained by identifying sections of the load which were representative of the waste source targeted (i.e., residential, commercial or industrial). Samples were manually removed in columns or sections of waste to account for light and heavy fractions.

A commercial sample obtained from the City of Winters contained the equivalent of a whole tire inflating the percentage of waste tires in the commercial waste stream composition. To arrive at an accurate estimate of the quantity of waste tires disposed of, a phone survey was conducted of automotive shops and garages which generate waste tires in Winters. From this information, the quantity of waste tires disposed of annually was estimated.

Two samples of commercial waste were obtained from the Unincorporated Area of the County. To arrive at an estimate of the composition representative of the commercial sector, the unincorporated samples were combined with samples obtained from the City of Winters. These samples were representative of waste generated from small businesses, schools, an automotive repair garage, a restaurant, and a farm machinery sales company.

Institutional samples from UCD were obtained from special collection routes designed to collect refuse from similar types of waste generators on campus. These special collection routes targeted the following waste sectors:

- Residential - waste originating from low-income housing and dormitories.
- Kitchen - waste originating from the Coffee House, Memorial Union, dining areas, etc.
- Institutional - waste originating from campus buildings and administration offices.
- Agricultural - waste originating from grounds trailers, Primate Center, Equestrian Center, sheep and beef barns, etc.

Self-Haul Waste Sources

A total of 125 self-haul vehicles were visually surveyed at YCCL for white goods, mixed yard waste, bulky wastes, and construction and demolition debris, with the remaining refuse characterized as miscellaneous waste. Field personnel made visual estimates of the volume of the targeted self-haul waste types being discarded. These volume estimates were then converted to weight estimates utilizing "loose" volume/weight conversion factors.

Seasonal Variations

Monthly waste disposal rates for each jurisdiction over the last four years were charted to identify any fluctuations in the waste stream due to seasonal variations. Monthly waste disposal rates for yard waste generated from the City of Woodland, nonaccounts, and the Esparto Convenience Center were also charted.

## 3.3.2. FINDINGS AND CONCLUSIONS

Section 3.3.2.1 presents estimates for the composition and quantity of refuse disposed of from the City of Woodland. Section 3.3.2.2 presents available seasonal information or monthly variations in waste generation.

### 3.3.2.1. Waste Generation

Estimates of the total quantity of waste disposed of by waste source for the City are summarized in Table 3-4.

Table 3-4. Waste Disposal Summary By Source - City of Woodland

| Source | Tons per year | Percent |
|---|---|---|
| Residential SFD | 10,597 | 15.78 |
| Residential MFD | 3,697 | 5.50 |
| Commercial | 30,750 | 45.78 |
| Industrial | 7,577 | 11.28 |
| Other Sources (separate yard waste collection) | 9,993 | 14.88 |
| Self-haul | 4,555 | 6.78 |
| Total | 67,169 | 100.0 |

Residential Waste Sources

The total quantity of waste generated from the residential sector is approximately 36 percent of the disposed waste stream. Based on waste sampling data, the average quantity of waste disposed of per household is approximately 40 pounds per week (not including separate yard waste collection). Hauler data indicates that the pounds per household of waste disposed of is approximately 39 pounds per week.

Waste types prevalent in the residential waste stream which can be targeted through source reduction, recycling, and composting programs are newspaper, cardboard, mixed waste paper, glass, tin, yard waste, and food waste.

Commercial/Industrial Waste Sources

The total quantity of waste disposed of from the commercial and industrial waste sectors account

for approximately 46 and 11 percent of the disposed waste stream respectively. Waste types prevalent in the commercial and industrial waste streams are cardboard, mixed waste paper, yard waste, metals, and wood waste.

Self-Haul Waste Sources

Based on the results of the YCCL survey, 28 percent of self-haul waste disposed of from the County is generated from the City of Woodland. Self-haul wastes account for approximately 7 percent of the City's discarded waste stream.

Tables 3-5 through 3-8 summarize the waste composition for residential, commercial, and industrial sources for the City. Tables 3-9 summarize the quantity of waste disposed by weight.

# TABLE 3–5. RESIDENTIAL WASTE COMPOSITION (SFD)
## CITY OF WOODLAND
### DATA SUMMARY/STATISTICAL ANALYSIS
(ALL VALUES % BY WEIGHT)

| | | | Min Value | Max Value | Mean | Std Dev | 90% Confidence Interval Lower | 90% Confidence Interval Upper |
|---|---|---|---|---|---|---|---|---|
| PAPER | TOTAL | 28.5% | | | | | | |
| Newspaper | | | 0.0 | 25.7 | 5.2 | 5.9 | 3.7 | 6.7 |
| Corrugated | | | 0.0 | 17.1 | 3.7 | 3.9 | 2.7 | 4.7 |
| High–Grade | | | 0.0 | 10.5 | 1.2 | 2.2 | 0.6 | 1.8 |
| Mixed | | | 0.0 | 42.1 | 10.4 | 9.1 | 8.1 | 12.8 |
| Cont. Paper | | | 0.0 | 16.9 | 8.0 | 4.3 | 6.9 | 9.1 |
| PLASTIC | TOTAL | 9.5% | | | | | | |
| PET | | | 0.0 | 2.7 | 0.5 | 0.8 | 0.3 | 0.7 |
| HDPE | | | 0.0 | 3.9 | 0.7 | 0.8 | 0.4 | 0.9 |
| Pigmented HDPE | | | 0.0 | 8.2 | 0.9 | 1.5 | 0.5 | 1.3 |
| PS | | | 0.0 | 5.3 | 0.6 | 0.8 | 0.4 | 0.8 |
| Film | | | 0.0 | 8.1 | 2.5 | 1.6 | 2.1 | 2.9 |
| Other Plastic | | | 0.0 | 17.3 | 4.3 | 4.2 | 3.3 | 5.4 |
| GLASS | TOTAL | 7.9% | | | | | | |
| CA redemption | | | 0.0 | 33.8 | 2.9 | 6.5 | 1.2 | 4.6 |
| Other recyclable | | | 0.0 | 23.1 | 4.9 | 5.4 | 3.6 | 6.3 |
| Non–recyclable | | | 0.0 | 0.5 | 0.0 | 0.1 | 0.0 | 0.1 |
| METAL | TOTAL | 5.3% | | | | | | |
| Aluminum cans | | | 0.0 | 1.1 | 0.2 | 0.3 | 0.1 | 0.2 |
| Bi–metal/tin | | | 0.0 | 12.1 | 3.4 | 2.8 | 2.7 | 4.1 |
| Ferrous metal | | | 0.0 | 11.2 | 1.1 | 2.3 | 0.5 | 1.7 |
| Non–ferrous metal | | | 0.0 | 4.3 | 0.6 | 0.8 | 0.4 | 0.8 |
| White goods | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| YARD WASTE | TOTAL | 6.2% | | | | | | |
| Grass, leaves | | | 0.0 | 0.5 | 0.0 | 0.1 | 0.0 | 0.0 |
| Prunnings | | | 0.0 | 67.3 | 6.2 | 15.2 | 2.3 | 10.1 |
| OTHER ORGANIC | TOTAL | 30.3% | | | | | | |
| Food | | | 0.0 | 55.4 | 17.0 | 12.6 | 13.8 | 20.3 |
| Tires | | | 0.0 | 1.3 | 0.0 | 0.2 | 0.0 | 0.1 |
| Rubber | | | 0.0 | 6.4 | 0.4 | 1.2 | 0.1 | 0.7 |
| Wood waste | | | 0.0 | 6.4 | 0.4 | 1.2 | 0.1 | 0.7 |
| Wood (press board, etc.) | | | 0.0 | 7.4 | 0.3 | 1.4 | 0.0 | 0.7 |
| Ag crop residue | | | 0.0 | 12.4 | 0.3 | 1.9 | 0.0 | 0.8 |
| Manure | | | 0.0 | 13.1 | 1.0 | 2.8 | 0.2 | 1.7 |
| Disposable diapers | | | 0.0 | 47.4 | 7.1 | 12.8 | 3.8 | 10.4 |
| Textiles, leather | | | 0.0 | 33.3 | 3.7 | 6.4 | 2.1 | 5.4 |
| OTHER WASTE | TOTAL | 12.0% | | | | | | |
| Asphalt | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Concrete | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Inert solids | | | 0.0 | 39.4 | 5.6 | 10.7 | 2.9 | 8.4 |
| Composite materials | | | 0.0 | 26.9 | 1.1 | 4.4 | 0.0 | 2.2 |
| HHW matl/container | | | 0.0 | 8.0 | 0.7 | 1.3 | 0.0 | 0.6 |
| Misc. | | | 0.0 | 36.8 | 5.0 | 7.4 | 3.1 | 6.9 |
| SPECIAL WASTE | TOTAL | 0.3% | | | | | | |
| Ash | | | 0.0 | 8.6 | 0.2 | 1.3 | 0.0 | 0.6 |
| Medical waste | | | 0.0 | 0.2 | 0.02 | 0.1 | 0.0 | 0.0 |
| Auto shredder | | | 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 |
| Bulky waste | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other special | | | 0.0 | 1.5 | 0.05 | 0.2 | 0.0 | 0.1 |
| | | | | | 100.0 | | | |

| | Min Value | Max Value | Mean | Std Dev | 90% Confidence Interval Lower | 90% Confidence Interval Upper |
|---|---|---|---|---|---|---|
| WASTE DISCARDED PER HOUSEHOLD (LBS/WK) | 1.9 | 109.8 | 40.2 | 26.2 | 33.5 | 46.9 |

# OF SAMPLES: 41

# TABLE 3–6. RESIDENTIAL WASTE COMPOSITION (MFD)
## REGIONAL WASTE COMPOSITION
### DATA SUMMARY/STATISTICAL ANALYSIS
(ALL VALUES % BY WEIGHT)

| | | | Min Value | Max Value | Mean | Std Dev | 90% Confidence Interval Lower | 90% Confidence Interval Upper |
|---|---|---|---|---|---|---|---|---|
| PAPER | TOTAL | 42.5% | | | | | | |
| Newspaper | | | 0.0 | 15.6 | 8.7 | 6.3 | 3.8 | 13.7 |
| Corrugated | | | 3.6 | 9.3 | 6.1 | 2.0 | 4.4 | 7.7 |
| High–Grade | | | 0.2 | 4.3 | 1.1 | 1.4 | 0.0 | 2.2 |
| Mixed | | | 2.8 | 12.0 | 9.6 | 3.2 | 7.1 | 12.1 |
| Cont. Paper | | | 8.0 | 51.7 | 17.0 | 15.6 | 4.7 | 29.4 |
| PLASTIC | TOTAL | 8.7% | | | | | | |
| PET | | | 0.0 | 0.4 | 0.2 | 0.1 | 0.1 | 0.3 |
| HDPE | | | 0.0 | 1.7 | 0.8 | 0.6 | 0.3 | 1.3 |
| Pigmented HDPE | | | 0.0 | 1.1 | 0.6 | 0.3 | 0.3 | 0.8 |
| PS | | | 0.3 | 1.4 | 0.6 | 0.4 | 0.3 | 0.9 |
| Film | | | 1.6 | 8.7 | 3.4 | 2.4 | 1.5 | 5.3 |
| Other Plastic | | | 1.1 | 5.2 | 3.1 | 1.2 | 2.2 | 4.1 |
| GLASS | TOTAL | 6.2% | | | | | | |
| CA redemption | | | 0.6 | 4.7 | 1.6 | 1.4 | 0.5 | 2.7 |
| Other recyclable | | | 0.3 | 11.7 | 4.5 | 3.8 | 1.5 | 7.6 |
| Non–recyclable | | | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| METAL | TOTAL | 4.7% | | | | | | |
| Aluminum cans | | | 0.2 | 0.9 | 0.5 | 0.3 | 0.3 | 0.7 |
| Bi–metal/tin | | | 0.2 | 3.6 | 2.3 | 1.2 | 1.4 | 3.3 |
| Ferrous metal | | | 0.0 | 6.6 | 1.6 | 2.3 | 0.0 | 3.4 |
| Non–ferrous metal | | | 0.1 | 0.8 | 0.3 | 0.2 | 0.1 | 0.5 |
| White goods | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| YARD WASTE | TOTAL | 3.3% | | | | | | |
| Grass, leaves | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Prunings | | | 0.0 | 16.1 | 3.3 | 5.9 | 0.0 | 8.0 |
| OTHER ORGANIC | TOTAL | 24.5% | | | | | | |
| Food | | | 5.3 | 17.0 | 11.9 | 3.5 | 9.1 | 14.7 |
| Tires | | | 0.0 | 6.4 | 1.2 | 2.3 | 0.0 | 3.1 |
| Rubber | | | 0.0 | 0.2 | 0.0 | 0.1 | 0.0 | 0.1 |
| Wood waste | | | 0.0 | 6.7 | 1.5 | 2.4 | 0.0 | 3.4 |
| Wood (press board, etc.) | | | 0.0 | 1.1 | 0.3 | 0.4 | 0.0 | 0.6 |
| Ag crop residue | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Manure | | | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Disposable diapers | | | 0.0 | 11.6 | 5.0 | 4.2 | 1.7 | 8.4 |
| Textiles, leather | | | 2.3 | 8.7 | 4.5 | 2.1 | 2.8 | 6.2 |
| OTHER WASTE | TOTAL | 10.0% | | | | | | |
| Asphalt | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Concrete | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Inert solids | | | 0.0 | 0.8 | 0.2 | 0.3 | 0.0 | 0.4 |
| Composite materials | | | 0.0 | 20.0 | 5.7 | 6.9 | 0.2 | 11.1 |
| HHW matl/container | | | 0.0 | 0.5 | 0.1 | 0.2 | 0.0 | 0.2 |
| Misc. | | | 2.5 | 6.0 | 4.0 | 1.1 | 3.1 | 4.9 |
| SPECIAL WASTE | TOTAL | 0.1% | | | | | | |
| Ash | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Medical waste | | | 0.0 | 0.6 | 0.1 | 0.2 | 0.0 | 0.3 |
| Auto shredder | | | 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 |
| Bulky waste | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other special | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TOTAL | | | | | 100.0 | | | |

AVERAGE SAMPLE WEIGHT: 217.5 LBS.

NO. OF SAMPLES: 6

# TABLE 3–7. COMMERCIAL WASTE COMPOSITION
## CITY OF WOODLAND
### DATA SUMMARY/STATISTICAL ANALYSIS
(ALL VALUES % BY WEIGHT)

| | | | Min Value | Max Value | Mean | Std Dev | 90% Confidence Interval Lower | 90% Confidence Interval Upper |
|---|---|---|---|---|---|---|---|---|
| PAPER | TOTAL | 32.8% | | | | | | |
| Newspaper | | | 0.0 | 6.7 | 1.4 | 1.9 | 0.6 | 2.2 |
| Corrugated | | | 0.0 | 27.3 | 13.9 | 9.1 | 10.0 | 17.8 |
| High–Grade | | | 0.0 | 31.4 | 4.3 | 7.8 | 1.0 | 7.6 |
| Mixed | | | 0.0 | 20.2 | 6.1 | 6.4 | 3.4 | 8.8 |
| Cont. Paper | | | 0.0 | 21.1 | 7.2 | 7.9 | 3.8 | 10.5 |
| PLASTIC | TOTAL | 9.6% | | | | | | |
| PET | | | 0.0 | 0.3 | 0.0 | 0.1 | 0.0 | 0.1 |
| HDPE | | | 0.0 | 1.1 | 0.1 | 0.3 | 0.0 | 0.3 |
| Pigmented HDPE | | | 0.0 | 6.8 | 0.9 | 1.8 | 0.1 | 1.6 |
| PS | | | 0.0 | 1.2 | 0.3 | 0.4 | 0.2 | 0.5 |
| Film | | | 0.0 | 10.5 | 2.7 | 2.7 | 1.6 | 3.9 |
| Other Plastic | | | 0.0 | 17.5 | 5.5 | 5.8 | 3.0 | 7.9 |
| GLASS | TOTAL | 1.0% | | | | | | |
| CA redemption | | | 0.0 | 3.5 | 0.8 | 1.1 | 0.4 | 1.3 |
| Other recyclable | | | 0.0 | 2.2 | 0.2 | 0.5 | 0.0 | 0.4 |
| Non–recyclable | | | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| METAL | TOTAL | 4.9% | | | | | | |
| Aluminum cans | | | 0.0 | 2.3 | 0.3 | 0.6 | 0.1 | 0.5 |
| Bi–metal/tin | | | 0.0 | 3.3 | 0.5 | 0.8 | 0.1 | 0.9 |
| Ferrous metal | | | 0.0 | 13.1 | 3.4 | 4.5 | 1.5 | 5.3 |
| Non–ferrous metal | | | 0.0 | 10.4 | 0.8 | 2.6 | 0.0 | 1.9 |
| White goods | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| YARD WASTE | TOTAL | 8.5% | | | | | | |
| Grass, leaves | | | 0.0 | 48.4 | 4.3 | 12.1 | 0.0 | 9.4 |
| Prunings | | | 0.0 | 49.2 | 4.2 | 12.3 | 0.0 | 9.4 |
| OTHER ORGANIC | TOTAL | 21.7% | | | | | | |
| Food | | | 0.0 | 14.1 | 3.2 | 4.3 | 1.4 | 5.1 |
| Tires | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rubber | | | 0.0 | 0.7 | 0.1 | 0.2 | 0.0 | 0.2 |
| Wood waste | | | 0.0 | 41.2 | 8.8 | 12.5 | 3.5 | 14.2 |
| Wood (press board, etc.) | | | 0.0 | 13.5 | 2.9 | 5.0 | 0.8 | 5.0 |
| Ag crop residue | | | 0.0 | 65.0 | 4.3 | 16.2 | 0.0 | 11.2 |
| Manure | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Disposable diapers | | | 0.0 | 6.9 | 0.9 | 2.0 | 0.1 | 1.8 |
| Textiles, leather | | | 0.0 | 12.7 | 1.3 | 3.1 | 0.0 | 2.6 |
| OTHER WASTE | TOTAL | 21.5% | | | | | | |
| Asphalt | | | 0.0 | 58.9 | 3.9 | 14.7 | 0.0 | 10.2 |
| Concrete | | | 0.0 | 28.5 | 5.4 | 10.2 | 1.1 | 9.7 |
| Inert solids | | | 0.0 | 79.8 | 9.0 | 21.1 | 0.0 | 17.9 |
| Composite materials | | | 0.0 | 15.1 | 1.6 | 3.8 | 0.0 | 3.2 |
| HHW matl/container | | | 0.0 | 0.9 | 0.1 | 0.2 | 0.0 | 0.2 |
| Misc. | | | 0.0 | 9.4 | 1.5 | 2.3 | 0.5 | 2.5 |
| SPECIAL WASTE | TOTAL | 0.0% | | | | | | |
| Ash | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Medical waste | | | 0.0 | 0.2 | 0.0 | 0.1 | 0.0 | 0.1 |
| Auto shredder | | | 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 |
| Bulky waste | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other special | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TOTAL | | | | | 100.0 | | | |

AVERAGE SAMPLE WEIGHT: 248.1 LBS.

NO. OF SAMPLES: 15

# TABLE 3–8. INDUSTRIAL WASTE COMPOSITION
## CITY OF WOODLAND
### DATA SUMMARY/STATISTICAL ANALYSIS
(ALL VALUES % BY WEIGHT)

| | | | Min Value | Max Value | Mean | Std Dev | 90% Confidence Interval Lower | 90% Confidence Interval Upper |
|---|---|---|---|---|---|---|---|---|
| PAPER | TOTAL | 28.1% | | | | | | |
| Newspaper | | | 0.0 | 4.3 | 0.8 | 1.4 | 0.1 | 1.6 |
| Corrugated | | | 1.8 | 36.6 | 15.2 | 12.3 | 8.5 | 22.0 |
| High–Grade | | | 0.0 | 4.7 | 0.7 | 1.5 | 0.0 | 1.5 |
| Mixed | | | 0.0 | 11.0 | 3.6 | 3.2 | 1.9 | 5.4 |
| Cont. Paper | | | 0.0 | 46.7 | 7.7 | 14.2 | 0.0 | 15.5 |
| PLASTIC | TOTAL | 13.4% | | | | | | |
| PET | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| HDPE | | | 0.0 | 0.3 | 0.0 | 0.1 | 0.0 | 0.1 |
| Pigmented HDPE | | | 0.0 | 2.1 | 0.4 | 0.7 | 0.0 | 0.7 |
| PS | | | 0.0 | 0.5 | 0.1 | 0.2 | 0.0 | 0.2 |
| Film | | | 0.0 | 13.7 | 3.9 | 4.1 | 1.6 | 6.1 |
| Other Plastic | | | 0.2 | 63.5 | 9.0 | 19.4 | 0.0 | 19.6 |
| GLASS | TOTAL | 0.4% | | | | | | |
| CA redemption | | | 0.0 | 0.8 | 0.2 | 0.3 | 0.0 | 0.4 |
| Other recyclable | | | 0.0 | 0.4 | 0.1 | 0.1 | 0.0 | 0.2 |
| Non–recyclable | | | 0.0 | 0.9 | 0.1 | 0.3 | 0.0 | 0.3 |
| METAL | TOTAL | 17.7% | | | | | | |
| Aluminum cans | | | 0.0 | 0.3 | 0.1 | 0.1 | 0.1 | 0.2 |
| Bi–metal/tin | | | 0.0 | 0.5 | 0.2 | 0.2 | 0.0 | 0.3 |
| Ferrous metal | | | 0.0 | 43.6 | 8.9 | 13.1 | 1.8 | 16.1 |
| Non–ferrous metal | | | 0.0 | 42.6 | 8.5 | 13.3 | 1.2 | 15.8 |
| White goods | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| YARD WASTE | TOTAL | 0.0% | | | | | | |
| Grass, leaves | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Prunings | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| OTHER ORGANIC | TOTAL | 29.2% | | | | | | |
| Food | | | 0.0 | 7.5 | 1.5 | 2.6 | 0.1 | 2.9 |
| Tires | | | 0.0 | 6.0 | 0.7 | 1.9 | 0.0 | 1.7 |
| Rubber | | | 0.0 | 10.0 | 1.2 | 3.1 | 0.0 | 2.9 |
| Wood waste | | | 0.0 | 36.3 | 15.9 | 13.1 | 8.7 | 23.2 |
| Wood (press board, etc.) | | | 0.0 | 29.0 | 8.1 | 10.8 | 2.2 | 14.0 |
| Ag crop residue | | | 0.0 | 7.3 | 0.8 | 2.3 | 0.0 | 2.1 |
| Manure | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Disposable diapers | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Textiles, leather | | | 0.0 | 8.3 | 0.9 | 2.6 | 0.0 | 2.4 |
| OTHER WASTE | TOTAL | 11.2% | | | | | | |
| Asphalt | | | 0.0 | 5.0 | 0.6 | 1.6 | 0.0 | 1.4 |
| Concrete | | | 0.0 | 3.0 | 0.3 | 0.9 | 0.0 | 0.9 |
| Inert solids | | | 0.0 | 38.2 | 7.7 | 14.4 | 0.0 | 15.6 |
| Composite materials | | | 0.0 | 15.5 | 2.2 | 4.9 | 0.0 | 4.9 |
| HHW matl/container | | | 0.0 | 0.2 | 0.1 | 0.1 | 0.0 | 0.1 |
| Misc. | | | 0.0 | 1.4 | 0.3 | 0.4 | 0.1 | 0.5 |
| SPECIAL WASTE | TOTAL | 0.0% | | | | | | |
| Ash | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Medical waste | | | 0.0 | 0.0 | 0.00 | 0.0 | 0.0 | 0.0 |
| Auto shredder | | | 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 |
| Bulky waste | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other special | | | 0.0 | 0.0 | 0.00 | 0.0 | 0.0 | 0.0 |
| TOTAL | | | | | 100.0 | | | |

AVERAGE SAMPLE WEIGHT: 349.1 LBS.

NO OF SAMPLES: 9

# TABLE 3–9. ESTIMATED WASTE DISPOSAL RATE BY WEIGHT
## CITY OF WOODLAND
### DATA SUMMARY

| WASTE TYPE | RESIDENTIAL S.F.D. (TONS/YEAR) | RESIDENTIAL M.F.D. (TONS/YEAR) | RESIDENTIAL TOTAL (TONS/YEAR) | COMMERCIAL (TONS/YEAR) | INDUSTRIAL (TONS/YEAR) | SELF–HAUL (TONS/YEAR) | OTHER WASTE (TONS/YEAR) | TOTAL WASTE (TONS/YEAR) | PERCENT WASTE (BY WEIGHT) |
|---|---|---|---|---|---|---|---|---|---|
| **PAPER** | | | | | | | | | |
| Newspaper | 549 | 323 | 872 | 430 | 64 | 0 | 0 | 1,367 | 2.0 |
| Corrugated | 388 | 224 | 611 | 4,270 | 1,153 | 0 | 0 | 6,035 | 9.0 |
| High–Grade | 125 | 40 | 166 | 1,311 | 52 | 0 | 0 | 1,528 | 2.3 |
| Mixed | 1,100 | 355 | 1,455 | 1,866 | 274 | 0 | 0 | 3,595 | 5.4 |
| Cont. Paper | 848 | 630 | 1,478 | 2,208 | 583 | 0 | 0 | 4,269 | 6.4 |
| **PLASTIC** | | | | | | | | | |
| PET | 50 | 7 | 57 | 11 | 0 | 0 | 0 | 68 | 0.1 |
| HDPE | 69 | 30 | 99 | 45 | 3 | 0 | 0 | 146 | 0.2 |
| Pigmented HDPE | 96 | 21 | 116 | 274 | 29 | 0 | 0 | 419 | 0.6 |
| PS | 66 | 23 | 88 | 102 | 10 | 0 | 0 | 200 | 0.3 |
| Film | 263 | 126 | 389 | 837 | 293 | 0 | 0 | 1,519 | 2.3 |
| Other Plastic | 459 | 115 | 574 | 1,682 | 684 | 0 | 0 | 2,941 | 4.4 |
| **GLASS** | | | | | | | | | |
| CA redemption | 305 | 61 | 365 | 259 | 14 | 0 | 0 | 638 | 1.0 |
| Other recyclable | 523 | 167 | 691 | 54 | 7 | 0 | 0 | 752 | 1.1 |
| Non–recyclable | 5 | 1 | 5 | 5 | 10 | 0 | 0 | 21 | 0.03 |
| **METAL** | | | | | | | | | |
| Aluminum cans | 17 | 19 | 36 | 92 | 11 | 0 | 0 | 138 | 0.2 |
| Bi–metal/tin | 362 | 87 | 449 | 152 | 12 | 0 | 0 | 613 | 0.9 |
| Ferrous metal | 116 | 58 | 174 | 1,037 | 678 | 0 | 0 | 1,889 | 2.8 |
| Non–ferrous metal | 63 | 11 | 74 | 232 | 642 | 0 | 0 | 948 | 1.4 |
| White goods | 0 | 0 | 0 | 0 | 0 | 68 | 0 | 68 | 0.1 |
| **YARD WASTE** | | | | | | | | | |
| Grass, leaves | 1 | 0 | 1 | 1,322 | 0 | 0 | 0 | 1,324 | 2.0 |
| Prunings | 652 | 122 | 774 | 1,280 | 0 | 0 | 0 | 2,054 | 3.1 |
| Mixed yard waste | 0 | 0 | 0 | 0 | 0 | 46 | 9,993 | 10,039 | 14.9 |
| **OTHER ORGANIC** | | | | 0 | 0 | | | | |
| Food | 1,801 | 440 | 2,241 | 999 | 113 | 0 | 0 | 3,353 | 5.0 |
| Tires | 4 | 45 | 49 | 0 | 53 | 0 | 0 | 102 | 0.2 |
| Rubber | 44 | 1 | 45 | 40 | 90 | 0 | 0 | 175 | 0.3 |
| Wood waste | 45 | 57 | 102 | 2,718 | 1,208 | 0 | 0 | 4,028 | 6.0 |
| Wood (press board, etc.) | 32 | 10 | 42 | 900 | 613 | 0 | 0 | 1,556 | 2.3 |
| Ag crop residue | 32 | 0 | 32 | 1,333 | 61 | 0 | 0 | 1,426 | 2.1 |
| Manure | 101 | 1 | 101 | 0 | 0 | 0 | 0 | 101 | 0.2 |
| Disposable diapers | 749 | 186 | 935 | 285 | 0 | 0 | 0 | 1,220 | 1.8 |
| Textiles, leather | 393 | 166 | 559 | 392 | 71 | 0 | 0 | 1,021 | 1.5 |
| **OTHER WASTE** | | | | | | | | | |
| Asphalt | 0 | 0 | 0 | 1,207 | 44 | 0 | 0 | 1,251 | 1.9 |
| Concrete | 0 | 0 | 0 | 1,653 | 25 | 0 | 0 | 1,678 | 2.5 |
| Inert solids | 596 | 8 | 604 | 2,757 | 586 | 0 | 0 | 3,947 | 5.9 |
| Composite materials | 112 | 209 | 322 | 494 | 167 | 0 | 0 | 983 | 1.5 |
| HHW matl/container | 74 | 3 | 77 | 37 | 4 | 0 | 0 | 119 | 0.2 |
| Misc. | 529 | 149 | 678 | 455 | 23 | 1,651 | 0 | 2,807 | 4.2 |
| **SPECIAL WASTE** | | | | | | | | | |
| Ash | 23 | 0 | 23 | 0 | 0 | 0 | 0 | 23 | 0.03 |
| Medical waste | 2 | 4 | 6 | 9 | 0 | 0 | 0 | 16 | 0.02 |
| Auto shredder | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Auto bodies | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Bulky waste | 0 | 0 | 0 | 0 | 0 | 80 | 0 | 80 | 0.1 |
| Other special | 5 | 0 | 5 | 0 | 0 | 0 | 0 | 5 | 0.007 |
| Construction/Demolition | 0 | 0 | 0 | 0 | 0 | 2,710 | 0 | 2,710 | 4.0 |
| **TOTAL** | **10,597** | **3,697** | **14,294** | **30,750** | **7,577** | **4,555** | **9,993** | **67,169** | **100.0** |

### 3.3.2.2 Seasonal Variations

Seasonal variations in monthly refuse disposal quantities were tabulated for each jurisdiction in Yolo County. This included waste generated from residential, commercial, and industrial waste sources. This information was used to provide an indication on the variability of the waste stream and regional basis for each of the jurisdictions in the County.

For the residential waste stream, peak waste generation occurs during the period of March through September.

For the commercial / industrial waste stream, monthly waste generation rates are highest during the period of March through November with decreases in the quantity of waste disposed during December, January, and February.

Waste generated from agricultural sources are greatest during the period from July through February. Companies processing tomato products generate higher quantities of waste during the period of July through September.

## 3.4 WASTE DIVERSION CHARACTERIZATION

The Waste Diversion Characterization study provides estimates of the composition and quantity of solid waste diverted (recycled, composted, transformed) during the year 1990. The quantity of waste which is diverted is applied to the overall waste diversion goals of 25 and 50 percent. Only those wastes which are normally disposed of at permitted solid waste disposal facilities are included. Waste diverted to transformation (incineration) facilities is not applicable for the short-term 25 percent goal, but may account for up to 10 percent of the medium-term 50 percent diversion goal.

### 3.4.1 Project Approach

The quantity of waste diverted through source reduction, recycling, composting, and transformation was estimated through a combination of available waste diversion data and recycling surveys. Recyclable material brokers, certified recycling centers, major employers, grocery operations, diaper services, and tire retailers were surveyed to identify existing waste diversion. The quantity of waste diverted through certified recycling centers was based on information provided by the Department of Conservation - Division of Recycling. Information with respect to City sponsored recycling programs were obtained through contract haulers servicing the area or by formal surveys.

The quantity of wood and yard waste diverted at YCCL was estimated through available tonnage records and a survey of self-haul sources. Clean loads of wood and yard waste delivered to YCCL are currently diverted and processed as wood fuel. The total quantity of waste processed at the facility during 1990 was approximately 7,000 tons. During the period of April 1 through

June 1, 1991, YCCL personnel surveyed 478 individuals hauling wood and yard waste to the recovery facility to determine the jurisdiction from which the waste originated.

The quantity of inert waste diverted for landfill construction purposes was estimated through available YCCL tonnage data. The quantity of inert waste allocated to each jurisdiction was based on the jurisdiction's population.

The quantity of waste diverted by the use of diaper services was estimated through a phone survey of diaper service companies servicing the study jurisdictions. Based on the number of clients per week and the average number of diapers used per client, the quantity of waste diverted through this source reduction activity was estimated.

Estimates of waste diversion for the City of Woodland are summarized in Table 3-10. Table 3-11 presents estimates of the total generated and percent diversion.

Table 3-10. City of Woodland Waste Diversion

| Waste Type | Source Reduction (TPY) | Recycling (Residential) (TPY) | Recycling (Commercial) (TPY) | Transformation (TPY) |
|---|---|---|---|---|
| Newspaper | | 407.0 | 86.2 | |
| Cardboard | | 110.0 | 1,780.3 | |
| High-grade | | | 45.0 | |
| PET | | 17.0 | 8.0 | |
| Other plastic | | | 1.4 | |
| CA Glass | | 503.9 | 148.0 | |
| Other glass | | 51.0 | 4.0 | |
| Aluminum | | 353.9 | 89.1 | |
| Food | | | 33.0 | |
| Tires | | | | 36.1 |
| Diapers | 59.5 | | | |
| Inert waste | | | 11,487.0 | |
| Wood waste | | | 73.9 | 2093.7 |
| Total | 59.5 | 1,442.8 | 13,755.9 | 2,129.8 |

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# TABLE 3-11. TOTAL WASTE GENERATION SUMMARY CITY OF WOODLAND

| WASTE TYPE | WASTE DISPOSED (TONS/YEAR) | WASTE DIVERTED (TONS/YEAR) | TOTAL GENERATED (TONS/YEAR) | PERCENT DIVERSION |
|---|---|---|---|---|
| **PAPER** | | | | |
| Newspaper | 1,366.8 | 493.2 | 1,860.0 | 0.58 |
| Corrugated | 6,034.8 | 1,890.3 | 7,925.1 | 2.24 |
| High-Grade | 1,528.2 | 45.0 | 1,573.2 | 0.05 |
| Mixed | 3,594.7 | 0.0 | 3,594.7 | 0.00 |
| Cont. Paper | 4,268.9 | 0.0 | 4,268.9 | 0.00 |
| **PLASTIC** | | | | |
| PET | 68.2 | 25.0 | 93.2 | 0.03 |
| HDPE | 146.2 | 0.0 | 146.2 | 0.00 |
| Pigmented HDPE | 418.8 | 0.0 | 418.8 | 0.00 |
| PS | 199.9 | 0.0 | 199.9 | 0.00 |
| Film | 1,519.2 | 0.0 | 1,519.2 | 0.00 |
| Other Plastic | 2,940.7 | 1.4 | 2,942.1 | 0.00 |
| **GLASS** | | | | |
| CA redemption | 638.5 | 651.9 | 1,290.4 | 0.77 |
| Other recyclable | 752.0 | 55.0 | 807.0 | 0.07 |
| Non-recyclable | 20.5 | 0.0 | 20.5 | 0.00 |
| **METAL** | | | | |
| Aluminum cans | 138.3 | 443.0 | 581.3 | 0.52 |
| Bi-metal/tin | 613.0 | 0.0 | 613.0 | 0.00 |
| Ferrous metal | 1,888.9 | 0.0 | 1,888.9 | 0.00 |
| Non-ferrous metal | 947.5 | 0.0 | 947.5 | 0.00 |
| White goods | 68.3 | 0.0 | 68.3 | 0.00 |
| **YARD WASTE** | | | | |
| Grass, leaves | 1,323.7 | 0.0 | 1,323.7 | 0.00 |
| Prunings | 2,054.0 | 0.0 | 2,054.0 | 0.00 |
| Mixed yard waste | 10,038.3 | 0.0 | 10,038.3 | 0.00 |
| **OTHER ORGANIC** | | | | |
| Food | 3,352.7 | 33.0 | 3,385.7 | 0.04 |
| Tires | 102.3 | 36.1 | 138.4 | 0.04 |
| Rubber | 174.6 | 0.0 | 174.6 | 0.00 |
| Wood waste | 4,028.0 | 2,167.7 | 6,195.7 | 2.56 |
| Wood (press board, etc.) | 1,555.6 | 0.0 | 1,555.6 | 0.00 |
| Ag crop residue | 1,426.0 | 0.0 | 1,426.0 | 0.00 |
| Manure | 101.3 | 0.0 | 101.3 | 0.00 |
| Disposable diapers | 1,220.0 | 59.5 | 1,279.5 | 0.07 |
| Textiles, leather | 1,021.4 | 0.0 | 1,021.4 | 0.00 |
| **OTHER WASTE** | | | | |
| Asphalt | 1,250.9 | 0.0 | 1,250.9 | 0.00 |
| Concrete | 1,678.1 | 0.0 | 1,678.1 | 0.00 |
| Inert solids | 3,946.5 | 11,487.0 | 15,433.5 | 13.58 |
| Composite materials | 982.8 | 0.0 | 982.8 | 0.00 |
| HHW matl/container | 118.9 | 0.0 | 118.9 | 0.00 |
| Misc. | 2,807.2 | 0.0 | 2,807.2 | 0.00 |
| **SPECIAL WASTE** | | | | |
| Ash | 22.6 | 0.0 | 22.6 | 0.00 |
| Medical waste | 15.6 | 0.0 | 15.6 | 0.00 |
| Auto shredder | 0.0 | 0.0 | 0.0 | 0.00 |
| Auto bodies | 0.0 | 0.0 | 0.0 | 0.00 |
| Bulky waste | 79.7 | 0.0 | 79.7 | 0.00 |
| Other special | 5.0 | 0.0 | 5.0 | 0.00 |
| Construction/Demolition | 2,710.0 | 0.0 | 2,710.0 | 0.00 |
| **TOTAL** | **67,169** | **17,388** | **84,557** | **20.6** |

## 3.5 WASTE GENERATION PROJECTIONS

The waste generation projections are based on population growth and estimates of tons of waste generated per capita. Waste generated per capita includes waste disposed and diverted by residential, commercial, industrial, and other waste sources in the City. Projections for population growth were provided by City and County Planning Departments. The quantity of waste generated per person annually, tons per capita (TPC), is based on the quantity of waste generated during 1990. It was assumed that the per capita generation rate increases annually at a rate of 1.5 percent.

Table 3-12 presents the 15 year waste generation projection for all waste disposed and diverted in the City. Tables 3-13 and 3-14 present 15 year waste disposal and diversion projections resulting from the implementation of the SRRE.

TABLE 3–12. WASTE GENERATION PROJECTIONS
CITY OF WOODLAND

| | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PAPER** | | | | | | | | | | | | | | | | |
| Newspaper | 1,860 | 1,929 | 2,001 | 2,076 | 2,154 | 2,234 | 2,313 | 2,395 | 2,479 | 2,567 | 2,657 | 2,751 | 2,848 | 2,949 | 3,053 | 3,160 |
| Corrugated | 7,925 | 8,221 | 8,528 | 8,846 | 9,176 | 9,519 | 9,855 | 10,203 | 10,563 | 10,936 | 11,322 | 11,722 | 12,135 | 12,564 | 13,007 | 13,467 |
| High–Grade | 1,573 | 1,632 | 1,693 | 1,756 | 1,822 | 1,890 | 1,956 | 2,025 | 2,097 | 2,171 | 2,247 | 2,327 | 2,409 | 2,494 | 2,582 | 2,673 |
| Mixed | 3,595 | 3,729 | 3,868 | 4,013 | 4,162 | 4,318 | 4,470 | 4,628 | 4,791 | 4,960 | 5,135 | 5,317 | 5,504 | 5,699 | 5,900 | 6,108 |
| Cont. Paper | 4,269 | 4,428 | 4,594 | 4,765 | 4,943 | 5,127 | 5,308 | 5,496 | 5,690 | 5,891 | 6,099 | 6,314 | 6,537 | 6,767 | 7,006 | 7,254 |
| **PLASTIC** | | | | | | | | | | | | | | | | |
| PET | 93 | 97 | 100 | 104 | 108 | 112 | 116 | 120 | 124 | 129 | 133 | 138 | 143 | 148 | 153 | 158 |
| HDPE | 146 | 152 | 157 | 163 | 169 | 176 | 182 | 188 | 195 | 202 | 209 | 216 | 224 | 232 | 240 | 248 |
| Pigmented HDPE | 419 | 434 | 451 | 468 | 485 | 503 | 521 | 539 | 558 | 578 | 598 | 619 | 641 | 664 | 687 | 712 |
| PS | 200 | 207 | 215 | 223 | 232 | 240 | 249 | 257 | 267 | 276 | 286 | 296 | 306 | 317 | 328 | 340 |
| Film | 1,519 | 1,576 | 1,635 | 1,696 | 1,759 | 1,825 | 1,889 | 1,956 | 2,025 | 2,096 | 2,170 | 2,247 | 2,326 | 2,408 | 2,493 | 2,582 |
| Other Plastic | 2,942 | 3,052 | 3,166 | 3,284 | 3,407 | 3,534 | 3,659 | 3,788 | 3,921 | 4,060 | 4,203 | 4,352 | 4,505 | 4,664 | 4,829 | 4,999 |
| **GLASS** | | | | | | | | | | | | | | | | |
| CA redemption | 1,290 | 1,339 | 1,388 | 1,440 | 1,494 | 1,550 | 1,605 | 1,661 | 1,720 | 1,781 | 1,843 | 1,909 | 1,976 | 2,046 | 2,118 | 2,193 |
| Other recyclable | 807 | 837 | 868 | 901 | 934 | 969 | 1,004 | 1,039 | 1,076 | 1,114 | 1,153 | 1,194 | 1,236 | 1,279 | 1,325 | 1,371 |
| Non–recyclable | 21 | 21 | 22 | 23 | 24 | 25 | 26 | 26 | 27 | 28 | 29 | 30 | 31 | 33 | 34 | 35 |
| **METAL** | | | | | | | | | | | | | | | | |
| Aluminum cans | 581 | 603 | 626 | 649 | 673 | 698 | 723 | 748 | 775 | 802 | 830 | 860 | 890 | 922 | 954 | 988 |
| Bi–metal/tin | 613 | 636 | 660 | 684 | 710 | 736 | 762 | 789 | 817 | 846 | 876 | 907 | 939 | 972 | 1,006 | 1,042 |
| Ferrous metal | 1,889 | 1,959 | 2,033 | 2,108 | 2,187 | 2,269 | 2,349 | 2,432 | 2,518 | 2,606 | 2,698 | 2,794 | 2,892 | 2,994 | 3,100 | 3,210 |
| Non–ferrous metal | 948 | 983 | 1,020 | 1,058 | 1,097 | 1,138 | 1,178 | 1,220 | 1,263 | 1,308 | 1,354 | 1,401 | 1,451 | 1,502 | 1,555 | 1,610 |
| White goods | 68 | 71 | 73 | 76 | 79 | 82 | 85 | 88 | 91 | 94 | 98 | 101 | 105 | 108 | 112 | 116 |
| **YARD WASTE** | | | | | | | | | | | | | | | | |
| Grass, leaves | 1,324 | 1,373 | 1,424 | 1,478 | 1,533 | 1,590 | 1,646 | 1,704 | 1,764 | 1,827 | 1,891 | 1,958 | 2,027 | 2,098 | 2,172 | 2,249 |
| Prunings | 2,054 | 2,131 | 2,210 | 2,293 | 2,378 | 2,467 | 2,554 | 2,644 | 2,738 | 2,834 | 2,934 | 3,038 | 3,145 | 3,256 | 3,371 | 3,490 |
| Mixed yard waste | 10,038 | 10,413 | 10,802 | 11,205 | 11,623 | 12,057 | 12,483 | 12,923 | 13,380 | 13,852 | 14,341 | 14,847 | 15,371 | 15,914 | 16,476 | 17,057 |
| **OTHER ORGANIC** | | | | | | | | | | | | | | | | |
| Food | 3,386 | 3,512 | 3,643 | 3,779 | 3,920 | 4,067 | 4,210 | 4,359 | 4,513 | 4,672 | 4,837 | 5,008 | 5,184 | 5,367 | 5,557 | 5,753 |
| Tires | 138 | 144 | 149 | 155 | 160 | 166 | 172 | 178 | 185 | 191 | 198 | 205 | 212 | 219 | 227 | 235 |
| Rubber | 175 | 181 | 188 | 195 | 202 | 210 | 217 | 225 | 233 | 241 | 249 | 258 | 267 | 277 | 287 | 297 |
| Wood waste | 6,196 | 6,427 | 6,667 | 6,916 | 7,174 | 7,442 | 7,704 | 7,976 | 8,258 | 8,549 | 8,851 | 9,164 | 9,487 | 9,822 | 10,169 | 10,528 |
| Wood (press board, etc.) | 1,556 | 1,614 | 1,674 | 1,736 | 1,801 | 1,868 | 1,934 | 2,003 | 2,073 | 2,147 | 2,222 | 2,301 | 2,382 | 2,466 | 2,553 | 2,643 |
| Ag crop residue | 1,426 | 1,479 | 1,534 | 1,592 | 1,651 | 1,713 | 1,773 | 1,836 | 1,901 | 1,968 | 2,037 | 2,109 | 2,184 | 2,261 | 2,340 | 2,423 |
| Manure | 101 | 105 | 109 | 113 | 117 | 122 | 126 | 130 | 135 | 140 | 145 | 150 | 155 | 161 | 166 | 172 |
| Disposable diapers | 1,280 | 1,327 | 1,377 | 1,428 | 1,482 | 1,537 | 1,591 | 1,647 | 1,705 | 1,766 | 1,828 | 1,892 | 1,959 | 2,028 | 2,100 | 2,174 |
| Textiles, leather | 1,021 | 1,060 | 1,099 | 1,140 | 1,183 | 1,227 | 1,270 | 1,315 | 1,361 | 1,409 | 1,459 | 1,511 | 1,564 | 1,619 | 1,676 | 1,736 |
| **OTHER WASTE** | | | | | | | | | | | | | | | | |
| Asphalt | 1,251 | 1,298 | 1,346 | 1,396 | 1,448 | 1,502 | 1,555 | 1,610 | 1,667 | 1,726 | 1,787 | 1,850 | 1,915 | 1,983 | 2,053 | 2,125 |
| Concrete | 1,678 | 1,741 | 1,806 | 1,873 | 1,943 | 2,016 | 2,087 | 2,160 | 2,237 | 2,316 | 2,397 | 2,482 | 2,570 | 2,660 | 2,754 | 2,852 |
| Inert solids | 15,434 | 16,010 | 16,607 | 17,227 | 17,870 | 18,538 | 19,192 | 19,869 | 20,571 | 21,297 | 22,049 | 22,827 | 23,633 | 24,467 | 25,331 | 26,225 |
| Composite materials | 983 | 1,020 | 1,058 | 1,097 | 1,138 | 1,180 | 1,222 | 1,265 | 1,310 | 1,356 | 1,404 | 1,454 | 1,505 | 1,558 | 1,613 | 1,670 |
| HHW matl/container | 119 | 123 | 128 | 133 | 138 | 143 | 148 | 153 | 158 | 164 | 170 | 176 | 182 | 188 | 195 | 202 |
| Misc. | 2,807 | 2,912 | 3,021 | 3,133 | 3,250 | 3,372 | 3,491 | 3,614 | 3,742 | 3,874 | 4,010 | 4,152 | 4,299 | 4,450 | 4,607 | 4,770 |
| **SPECIAL WASTE** | | | | | | | | | | | | | | | | |
| Ash | 23 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 35 | 36 | 37 | 38 |
| Medical waste | 16 | 16 | 17 | 17 | 18 | 19 | 19 | 20 | 21 | 22 | 22 | 23 | 24 | 25 | 26 | 27 |
| Auto shredder | 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 |
| Bulky waste | 80 | 83 | 86 | 89 | 92 | 96 | 99 | 103 | 106 | 110 | 114 | 118 | 122 | 126 | 131 | 135 |
| Other special | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 |
| Construction/Demolition | 2,710 | 2,811 | 2,916 | 3,025 | 3,138 | 3,255 | 3,370 | 3,489 | 3,612 | 3,740 | 3,872 | 4,008 | 4,150 | 4,296 | 4,448 | 4,605 |
| TOTAL | 84,557 | 87,715 | 90,987 | 94,385 | 97,907 | 101,564 | 105,148 | 108,859 | 112,701 | 116,680 | 120,800 | 125,065 | 129,479 | 134,048 | 138,781 | 143,681 |

TABLE 3–13. WASTE DIVERSION THROUGH SRRE IMPLEMENTATION
CITY OF WOODLAND

| | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PAPER** | | | | | | | | | | | | | | | | |
| Newspaper | 493 | 511 | 925 | 1,027 | 1,142 | 1,183 | 1,223 | 1,391 | 1,569 | 1,757 | 1,957 | 2,023 | 2,092 | 2,164 | 2,237 | 2,314 |
| Corrugated | 1,890 | 1,958 | 2,029 | 3,308 | 4,676 | 6,139 | 7,017 | 7,948 | 8,577 | 9,239 | 9,937 | 10,276 | 10,626 | 10,989 | 11,363 | 11,751 |
| High–Grade | 45 | 47 | 48 | 353 | 523 | 705 | 897 | 1,241 | 1,428 | 1,625 | 1,835 | 1,897 | 1,962 | 2,029 | 2,098 | 2,170 |
| Mixed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 546 | 1,129 | 1,751 | 2,414 | 2,496 | 2,582 | 2,670 | 2,761 | 2,855 |
| Cont. Paper | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 712 | 1,473 | 2,284 | 2,362 | 2,443 | 2,526 | 2,612 | 2,701 | 2,793 |
| **PLASTIC** | | | | | | | | | | | | | | | | |
| PET | 25 | 26 | 39 | 52 | 66 | 69 | 71 | 76 | 82 | 88 | 94 | 98 | 101 | 104 | 108 | 112 |
| HDPE | 0 | 0 | 17 | 36 | 55 | 57 | 59 | 74 | 90 | 106 | 124 | 128 | 133 | 137 | 142 | 147 |
| Pigmented HDPE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 77 | 160 | 248 | 342 | 353 | 365 | 378 | 391 | 404 |
| PS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Film | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 59 | 91 | 94 | 97 | 101 | 104 | 108 | 111 |
| Other Plastic | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 290 | 599 | 928 | 959 | 992 | 1,026 | 1,061 | 1,097 | 1,134 |
| **GLASS** | | | | | | | | | | | | | | | | |
| CA redemption | 652 | 675 | 900 | 1,027 | 1,166 | 1,273 | 1,316 | 1,389 | 1,465 | 1,545 | 1,628 | 1,684 | 1,741 | 1,800 | 1,862 | 1,925 |
| Other recyclable | 55 | 57 | 414 | 504 | 606 | 643 | 665 | 694 | 724 | 755 | 788 | 815 | 842 | 871 | 901 | 932 |
| Non–recyclable | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **METAL** | | | | | | | | | | | | | | | | |
| Aluminum cans | 443 | 459 | 491 | 512 | 533 | 553 | 572 | 617 | 666 | 717 | 770 | 797 | 824 | 852 | 881 | 911 |
| Bi–metal/tin | 0 | 0 | 243 | 293 | 351 | 364 | 377 | 431 | 490 | 551 | 617 | 638 | 659 | 682 | 705 | 729 |
| Ferrous metal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 438 | 906 | 1,406 | 1,938 | 2,004 | 2,073 | 2,143 | 2,216 | 2,292 |
| Non–ferrous metal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 223 | 461 | 715 | 986 | 1,020 | 1,055 | 1,091 | 1,128 | 1,166 |
| White goods | 0 | 0 | 58 | 60 | 63 | 65 | 67 | 69 | 72 | 74 | 77 | 79 | 82 | 85 | 88 | 91 |
| **YARD WASTE** | | | | | | | | | | | | | | | | |
| Grass, leaves | 0 | 0 | 0 | 147 | 305 | 473 | 653 | 844 | 872 | 902 | 933 | 965 | 998 | 1,032 | 1,067 | 1,103 |
| Prunings | 0 | 0 | 334 | 591 | 846 | 1,173 | 1,213 | 1,320 | 1,365 | 1,411 | 1,459 | 1,509 | 1,561 | 1,614 | 1,669 | 1,726 |
| Mixed yard waste | 0 | 0 | 10,032 | 10,394 | 10,767 | 11,155 | 11,556 | 11,972 | 12,380 | 12,802 | 13,239 | 13,690 | 14,157 | 14,640 | 15,139 | 15,655 |
| **OTHER ORGANIC** | | | | | | | | | | | | | | | | |
| Food | 33 | 34 | 35 | 87 | 90 | 93 | 152 | 180 | 210 | 229 | 237 | 245 | 253 | 262 | 271 | 280 |
| Tires | 0 | 0 | 0 | 0 | 0 | 43 | 45 | 46 | 48 | 49 | 51 | 53 | 54 | 56 | 58 | 60 |
| Rubber | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wood waste | 0 | 0 | 0 | 0 | 0 | 2,587 | 2,675 | 3,768 | 4,932 | 6,171 | 7,489 | 7,745 | 8,009 | 8,282 | 8,564 | 8,856 |
| Wood (press board, etc.) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 386 | 799 | 1,239 | 1,709 | 1,767 | 1,827 | 1,890 | 1,954 | 2,021 |
| Ag crop residue | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Manure | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Disposable diapers | 60 | 62 | 64 | 66 | 69 | 71 | 73 | 76 | 79 | 81 | 84 | 87 | 90 | 93 | 96 | 99 |
| Textiles, leather | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **OTHER WASTE** | | | | | | | | | | | | | | | | |
| Asphalt | 0 | 0 | 402 | 556 | 720 | 745 | 1,156 | 1,196 | 1,236 | 1,279 | 1,322 | 1,367 | 1,414 | 1,462 | 1,512 | 1,564 |
| Concrete | 0 | 0 | 540 | 747 | 967 | 1,002 | 1,554 | 1,607 | 1,661 | 1,718 | 1,777 | 1,837 | 1,900 | 1,964 | 2,031 | 2,101 |
| Inert solids | 11,487 | 11,901 | 12,329 | 12,772 | 13,232 | 13,708 | 14,176 | 14,659 | 15,158 | 15,675 | 16,210 | 16,763 | 17,334 | 17,925 | 18,536 | 19,169 |
| Composite materials | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HHW matl/container | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Misc. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **SPECIAL WASTE** | | | | | | | | | | | | | | | | |
| Ash | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Medical waste | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Auto shredder | 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 |
| Bulky waste | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other special | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Construction/Demolition | 0 | 0 | 2,327 | 2,411 | 2,497 | 2,587 | 2,675 | 2,767 | 2,861 | 2,959 | 3,059 | 3,164 | 3,272 | 3,383 | 3,498 | 3,618 |
| **TOTAL** | 15,184 | 15,731 | 31,230 | 34,943 | 38,676 | 44,689 | 48,193 | 55,066 | 61,549 | 68,398 | 74,492 | 77,032 | 79,658 | 82,374 | 85,183 | 88,088 |

TABLE 3--14. WASTE DISPOSAL THROUGH SRRE IMPLEMENTATION
CITY OF WOODLAND

| | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PAPER** | | | | | | | | | | | | | | | | |
| Newspaper | 1,367 | 1,418 | 1,076 | 1,049 | 1,012 | 1,051 | 1,090 | 1,004 | 910 | 809 | 701 | 728 | 756 | 785 | 815 | 847 |
| Corrugated | 6,035 | 6,263 | 6,499 | 5,539 | 4,500 | 3,381 | 2,838 | 2,255 | 1,986 | 1,696 | 1,385 | 1,446 | 1,509 | 1,575 | 1,644 | 1,716 |
| High--Grade | 1,528 | 1,585 | 1,645 | 1,403 | 1,298 | 1,185 | 1,059 | 784 | 669 | 546 | 413 | 430 | 447 | 465 | 484 | 504 |
| Mixed | 3,595 | 3,729 | 3,868 | 4,013 | 4,162 | 4,318 | 4,470 | 4,082 | 3,662 | 3,209 | 2,721 | 2,820 | 2,923 | 3,029 | 3,139 | 3,253 |
| Cont. Paper | 4,269 | 4,428 | 4,594 | 4,765 | 4,943 | 5,127 | 5,308 | 4,784 | 4,217 | 3,606 | 3,736 | 3,871 | 4,011 | 4,155 | 4,305 | 4,460 |
| **PLASTIC** | | | | | | | | | | | | | | | | |
| PET | 68 | 71 | 62 | 52 | 42 | 43 | 45 | 43 | 42 | 41 | 39 | 40 | 42 | 43 | 45 | 47 |
| HDPE | 146 | 152 | 140 | 128 | 114 | 118 | 123 | 114 | 105 | 95 | 85 | 88 | 91 | 95 | 98 | 102 |
| Pigmented HDPE | 419 | 434 | 451 | 468 | 485 | 503 | 521 | 462 | 398 | 330 | 257 | 266 | 276 | 286 | 297 | 308 |
| PS | 200 | 207 | 215 | 223 | 232 | 240 | 249 | 257 | 267 | 276 | 286 | 296 | 306 | 317 | 328 | 340 |
| Film | 1,519 | 1,576 | 1,635 | 1,696 | 1,759 | 1,825 | 1,889 | 1,928 | 1,968 | 2,005 | 2,076 | 2,150 | 2,226 | 2,304 | 2,386 | 2,470 |
| Other Plastic | 2,941 | 3,051 | 3,164 | 3,282 | 3,405 | 3,532 | 3,657 | 3,497 | 3,323 | 3,132 | 3,244 | 3,360 | 3,479 | 3,603 | 3,732 | 3,865 |
| **GLASS** | | | | | | | | | | | | | | | | |
| CA redemption | 638 | 663 | 489 | 413 | 328 | 277 | 288 | 272 | 255 | 236 | 215 | 225 | 235 | 245 | 256 | 267 |
| Other recyclable | 752 | 780 | 454 | 397 | 328 | 327 | 339 | 345 | 352 | 358 | 365 | 379 | 393 | 408 | 424 | 440 |
| Non--recyclable | 21 | 21 | 22 | 23 | 24 | 25 | 26 | 26 | 27 | 28 | 29 | 30 | 31 | 33 | 34 | 35 |
| **METAL** | | | | | | | | | | | | | | | | |
| Aluminum cans | 138 | 144 | 134 | 137 | 140 | 146 | 151 | 131 | 109 | 85 | 60 | 63 | 66 | 70 | 73 | 77 |
| Bi--metal/tin | 613 | 636 | 417 | 391 | 358 | 372 | 386 | 358 | 327 | 295 | 259 | 269 | 279 | 290 | 301 | 313 |
| Ferrous metal | 1,889 | 1,959 | 2,033 | 2,108 | 2,187 | 2,269 | 2,349 | 1,994 | 1,611 | 1,201 | 760 | 789 | 820 | 851 | 884 | 918 |
| Non--ferrous metal | 948 | 983 | 1,020 | 1,058 | 1,097 | 1,138 | 1,178 | 997 | 802 | 592 | 367 | 381 | 396 | 411 | 427 | 444 |
| White goods | 68 | 71 | 15 | 16 | 16 | 17 | 18 | 19 | 19 | 20 | 21 | 22 | 22 | 23 | 24 | 25 |
| **YARD WASTE** | | | | | | | | | | | | | | | | |
| Grass, leaves | 1,324 | 1,373 | 1,424 | 1,330 | 1,228 | 1,117 | 993 | 860 | 892 | 924 | 958 | 993 | 1,029 | 1,067 | 1,106 | 1,146 |
| Prunings | 2,054 | 2,131 | 1,876 | 1,702 | 1,532 | 1,294 | 1,341 | 1,325 | 1,373 | 1,423 | 1,475 | 1,529 | 1,585 | 1,642 | 1,702 | 1,764 |
| Mixed yard waste | 10,038 | 10,413 | 769 | 811 | 856 | 902 | 927 | 951 | 999 | 1,049 | 1,102 | 1,157 | 1,214 | 1,274 | 1,336 | 1,402 |
| **OTHER ORGANIC** | | | | | | | | | | | | | | | | |
| Food | 3,353 | 3,478 | 3,608 | 3,693 | 3,830 | 3,974 | 4,059 | 4,179 | 4,303 | 4,443 | 4,600 | 4,763 | 4,931 | 5,105 | 5,286 | 5,473 |
| Tires | 138 | 144 | 149 | 155 | 160 | 123 | 128 | 132 | 137 | 142 | 147 | 152 | 158 | 163 | 169 | 175 |
| Rubber | 175 | 181 | 188 | 195 | 202 | 210 | 217 | 225 | 233 | 241 | 249 | 258 | 267 | 277 | 287 | 297 |
| Wood waste | 6,196 | 6,427 | 6,667 | 6,916 | 7,174 | 4,855 | 5,029 | 4,209 | 3,326 | 2,378 | 1,362 | 1,419 | 1,479 | 1,540 | 1,605 | 1,672 |
| Wood (press board, etc.) | 1,556 | 1,614 | 1,674 | 1,736 | 1,801 | 1,868 | 1,934 | 1,616 | 1,274 | 907 | 513 | 534 | 555 | 576 | 599 | 623 |
| Ag crop residue | 1,426 | 1,479 | 1,534 | 1,592 | 1,651 | 1,713 | 1,773 | 1,836 | 1,901 | 1,968 | 2,037 | 2,109 | 2,184 | 2,261 | 2,340 | 2,423 |
| Manure | 101 | 105 | 109 | 113 | 117 | 122 | 126 | 130 | 135 | 140 | 145 | 150 | 155 | 161 | 166 | 172 |
| Disposable diapers | 1,220 | 1,266 | 1,313 | 1,362 | 1,413 | 1,466 | 1,518 | 1,571 | 1,627 | 1,684 | 1,744 | 1,806 | 1,869 | 1,936 | 2,004 | 2,075 |
| Textiles, leather | 1,021 | 1,060 | 1,099 | 1,140 | 1,183 | 1,227 | 1,270 | 1,315 | 1,361 | 1,409 | 1,459 | 1,511 | 1,564 | 1,619 | 1,676 | 1,736 |
| **OTHER WASTE** | | | | | | | | | | | | | | | | |
| Asphalt | 1,251 | 1,298 | 944 | 841 | 729 | 757 | 399 | 415 | 431 | 447 | 465 | 483 | 501 | 521 | 541 | 562 |
| Concrete | 1,678 | 1,741 | 1,265 | 1,127 | 976 | 1,014 | 533 | 554 | 575 | 598 | 621 | 645 | 670 | 696 | 723 | 751 |
| Inert solids | 3,947 | 4,109 | 4,279 | 4,455 | 4,638 | 4,829 | 5,016 | 5,211 | 5,412 | 5,621 | 5,839 | 6,064 | 6,299 | 6,542 | 6,794 | 7,056 |
| Composite materials | 983 | 1,020 | 1,058 | 1,097 | 1,138 | 1,180 | 1,222 | 1,265 | 1,310 | 1,356 | 1,404 | 1,454 | 1,505 | 1,558 | 1,613 | 1,670 |
| HHW matl/container | 119 | 123 | 128 | 133 | 138 | 143 | 148 | 153 | 158 | 164 | 170 | 176 | 182 | 188 | 195 | 202 |
| Misc. | 2,807 | 2,912 | 3,021 | 3,133 | 3,250 | 3,372 | 3,491 | 3,614 | 3,742 | 3,874 | 4,010 | 4,152 | 4,299 | 4,450 | 4,607 | 4,770 |
| **SPECIAL WASTE** | | | | | | | | | | | | | | | | |
| Ash | 23 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 35 | 36 | 37 | 38 |
| Medical waste | 16 | 16 | 17 | 17 | 18 | 19 | 19 | 20 | 21 | 22 | 22 | 23 | 24 | 25 | 26 | 27 |
| Auto shredder | 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 |
| Bulky waste | 80 | 83 | 86 | 89 | 92 | 96 | 99 | 103 | 106 | 110 | 114 | 118 | 122 | 126 | 131 | 135 |
| Other special | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 |
| Construction/Demolition | 2,710 | 2,811 | 589 | 614 | 641 | 668 | 695 | 722 | 751 | 781 | 812 | 845 | 878 | 913 | 949 | 987 |
| **TOTAL** | 69,373 | 71,984 | 59,758 | 59,442 | 59,231 | 56,874 | 56,955 | 53,793 | 51,153 | 48,283 | 46,308 | 48,033 | 49,820 | 51,674 | 53,598 | 55,593 |

## 3.6 WASTE TYPE DESCRIPTIONS

### PAPER

Newspaper: Post consumer newspaper and shredded newsprint, including newspaper inserts such as magazine, comics, etc.

Corrugated paper: Paperboard containers fabricated from two layers of kraft linerboard sandwiched around a corrugated medium. Kraft paper was also included in this category.

High-Grade paper: Continuous form computer paper, and white and colored ledger.

Mixed paper: All other paper including envelopes, magazine, clipboard, paper packaging, etc.

Contaminated paper: Various grades of paper which had been contaminated with food waste or had a high moisture content.

### PLASTIC

HDPE (high-density polyethylene) containers: Nonpigmented plastic containers for milk, water, etc.

PET (polyethylene terephthalate) containers: Beverage containers.

Film plastics: Trash bags, grocery bags, food bags, plastic food wrap, and sheet plastic.

PS (polystyrene) plastics: Food, beverage, packaging, other product containers made of expanded and nonexpanded polystyrene.

Other plastics: Liquid containers and dispensers, food containers, disposable utensils and plates, molded products, extruded pipes, etc.

### GLASS

California redemption containers: Glass bottles labeled "California Redemption Value".

Other recyclable containers: All food, beverage, and other glass containers with the exception of California redemption containers.

Other glass: Nonrecyclable glass products such as plate glass, light bulbs, mirrors, and other glass materials.

METALS

Aluminum cans: Redemption and nonredemption aluminum cans; soda, beer, and food containers.

Tin cans: Containers for food, beverage, or other products which include tin.

Ferrous metals: Metal material with magnetic properties.

Nonferrous: Nonmagnetic metals such as scrap aluminum, copper tubing, brass fixtures, aluminum furniture, aluminum foil, etc.

White goods: Large appliances such as dishwashers, hot water heaters, stoves, washer, dryers,etc.

YARD WASTE

Grass / Leaves: Grass clippings, leaves, and other organic waste resulting from landscaping activities.

Pruning: Shrub and brush pruning, small tree clippings (natural wood, up to a diameter of 8 inches), and other landscaping and gardening waste.

Mixed yard waste: Yard waste resulting from the separate yard waste collection.

OTHER ORGANIC MATERIALS

Food waste: Animal, fruit, or vegetable wastes resulting from the preparation, cooking, or handling of food.

Tires / Rubber products: Automobile tires, scrap rubber from manufacturing operations, rubber mats, etc.

Wood waste: Pallets, scrap wood, and dimensional lumber.

Wood Waste (press board, etc.): Wood which has been treated. Materials included particle board, press board, plywood, and wood which had been painted.

Agricultural crop residue: Agricultural crop residue such as rice hulls and tomato by-products from farming or food processing operations.

Manure: Animal excrement.

Disposable Diapers: All diapers consisting of plastic and paper intended for one-time-only use.

Textiles / Leather: Discarded clothing and waste from garment, rug, and leather product manufacturers.

OTHER WASTE

Asphalt waste: A tar-like substance used in paving applications.

Concrete waste: Building material made of cement, sand, gravel, and similar materials.

Other inert solids: Ceramic, rock, brick, gravel, soil, sheet rock, and other similar materials.

Composite materials: Products consisting of several different materials such as metal and plastic. Products characterized as composite materials category included TV sets, food processors, etc.

Household Hazardous Waste (HHW): Waste resulting from products purchased by the general public for household use which may pose a hazard to human health or the environment. Examples of HHW include paint, pesticides, cleaners, batteries, petroleum products, and other similar household products. Recorded weights of HHW included the weight of the containers.

Miscellaneous: A mixture of organic and inorganic materials less than two inches in diameter not easily sorted out for characterization. Contaminated waste paper from fast restaurants was also included.

SPECIAL WASTE

Ash: Waste resulting from the combustion of organic materials.

Medical Waste: Medical waste from the residential and commercial sectors included hypodermic needles, syringes, prescription drugs, bandages, etc. Medical waste disposed of by UCD during the waste characterization study included animal parts, needles, bandages, and vials of blood.

Auto shredder waste: Waste resulting from the shedding of automobiles, trucks, discarded appliances, etc., consisting of a combination of metals, plastics, glass, paints, and other non metallic materials.

Auto bodies: Discarded automobiles and trucks.

Bulky Items: Items such as discarded furniture and mattresses.

Construction / Demolition debris: Construction and demolition debris identified as being

generated from self-haul sources consisted largely of wood, asphalt, inert solids, and metals.

# SECTION 4

## SOURCE REDUCTION COMPONENT

Source reduction is defined by the California Integrated Waste Management Board 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 nonrecyclable 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. Recycling and composting are therefore addressed in separate components.

Source reduction is a process that 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 are purchased, and when they reach the end of their useful lives. Technical options for communities considering source reduction include product reuse, reduced material volume and/or weight specifications, reduced toxicity, increased product lifetime, and decreased consumption.

Because source reduction is not a formal waste management practice and materials not used are not weighed or otherwise regularly quantified, it is difficult to assess the actual impact that source reduction programs will have on the waste stream. However, source reduction may be practiced at the business and household levels through selective buying patterns and extending the utilization of products and materials. Because source reduction requires changing attitudes and behavioral patterns, a major effort must focus on education. Source reduction programs could also require research, financial incentives and disincentives, regulations, and technological developments.

The Waste Generation Study for The City of Woodland identified target materials available for source reduction programs as: yard waste, wood, textiles/leathers, high-grade paper, and appliances. All types of yard waste can be removed from the residential waste stream by backyard composting. The useable life of textiles, leather products, and appliances can be extended by donating them to charities and thrift shops. Extended use of high-grade paper is achieved in offices through the use of waste paper as telephone message pads and scratch paper, the use of double-sided copies, and the use of routing slips rather than memos.

## 4.1 GOALS AND OBJECTIVES

Source reduction is critical in the overall integrated waste management plan. By taking steps to prevent waste from entering the waste stream, the City of Woodland can avoid costly programs that will recycle, compost, or transport and dispose of the material. The City must develop and implement source reduction programs which work well at the municipal level, while providing support to the activities which can best be accomplished on a larger scale at the State and Federal levels. In light of this goal, the City of Woodland has adopted the following objectives for accomplishment during the short and medium term planning periods. These are:

- Educating residents and companies regarding the concept and practice of source reduction including descriptions of materials or products which are generally re-usable. Target awareness levels are 60 percent of City residents by 1995 and 90 percent by 2000.

- Devising methods of quantifying source reduction including residents and businesses such as thrift shops and other commercial or industrial activities.

- Evaluate the current residential refuse rate structure to a quantity-based rate which increases as more cans are placed at the curb.

- Improving the efficiency of office paper use in City offices by 25 percent in 1995 and up to 40 percent by the year 2000.

- Raise City employee awareness of source reduction programs to 80 percent by 1995.

- Adopt City Government procurement policies to result in a 20 percent increase of the purchase of recyclable materials, reusable items, and more durable goods by 1995.

- Develop a "Master Composter" program in the City to educate residents about proper backyard composting techniques during the short-term planning period.

- Reducing the amount of yard wastes entering the waste stream by attaining a 10 percent participation rate of all City households in backyard composting in the short-term and up to 15 percent during the medium-term.

- Develop an awards program for commercial businesses to high-light private in-house source reduction, recycling, and composting programs.

Priority Materials for Waste Diversion

The type and amount of materials to be targeted by source reduction activities are shown in Table 4-1.

Table 4-1. Target Materials for Source Reduction Programs

| Materials | Amount Disposed (TPY) | Percentage of Disposed Waste Stream | Criteria for Selection |
|---|---|---|---|
| Corrugated containers | 6,034.8 | 7.1 | • reusable |
| High grade paper | 1,528.2 | 1.8 | • recycle in offices<br>• electronic mail |
| Mixed paper | 3,594.7 | 4.3 | • reduced junk mail |
| Plastics | 5,293.0 | 6.3 | • conversion from styrene<br>• replace disposables with reusables |
| Wood wastes | 4,028.0 | 4.8 | • reuse for new items |
| Yard waste | 13,416.0 | 15.9 | • backyard composting |
| Food waste | 3,352.7 | 4.0 | • food banks<br>• animal feed |
| Tires & rubber | 102.3 | 0.1 | • consider life cycle when purchasing |
| White goods | 68.3 | 0.1 | • repairs, thrift shops |
| Textiles & Leather | 1,021.0 | 1.2 | • repairs, thrift shops |
| Diapers | 1,220.0 | 1.4 | • diaper services |
| Totals | 39,659.0 | 46.9 | --- |

## 4.2 EXISTING CONDITIONS

At present, there are no structured source reduction programs in the City of Woodland. Source reduction, however, does take place through a diaper service, thrift stores, and backyard composting.

Two diaper services currently service 103 residences in the City. At an average use of 50 diapers per week, the City presently diverts 59.5 TPY of disposable diapers (267,800 per year divided by 4,500 diapers per ton[1]). This amount can be counted as diversion credit towards the City's diversion goals mandated by AB 939. The 59.5 TPY represents less than one tenth of one percent of the solid waste generated in 1990.

Detailed records are not available for the amounts of materials diverted through thrift store operations. These quantities are assumed to be very small relative to the total amount of waste generated in the City (less than 1 percent); therefore, no diversion credit is currently being claimed by the City for this diversion. It is assumed that all of these stores will continue operating throughout the short-term planning period. In fact, as public awareness grows regarding the need to participate in source reduction programs, these stores may see a significant increase in materials. During the short-term planning period, it will be important to develop a system to monitor types and quantities of materials donated to thrift shops for future diversion credit.

It is assumed that residential backyard composting does take place in the City, although the participation rate is unknown. No diversion credit will be claimed for this activity until monitoring programs are implemented in the short-term planning period.

## 4.3 EVALUATION OF ALTERNATIVES

The ten source reduction alternatives described and evaluated in this section are listed by category below:

Rate Structure Modifications

- Alternative 1. Quantity-Based Variable Rates or User Fees (selected as a contingency alternative)

Economic Incentives

- Alternative 2. Loans, Loan Guarantees, Grants and Contributions (not selected)
- Alternative 3. Commercial Business Compliance Programs (not selected)

Technical Assistance

- Alternative 4. Waste Evaluations/Waste Minimization (not selected)
- Alternative 5. Backyard Composting Programs (selected)
- Alternative 6. Educational Efforts (selected)
- Alternative 7. Awards and Public Recognition (selected)
- Alternative 8. Government Nonprocurement Source Reduction Policies (selected)

Regulatory Programs

- Alternative 9. Government Procurement Policies (selected)

Alternative 10. Product Bans (not selected)

These alternatives are described below and evaluated according to the California Integrated Waste Management Board specified criteria.

Alternative 1. Quantity-Based Variable Residential Refuse Rates or User Fees (Selected)

Quantity-based variable rates or user fees are primarily intended to foster source reduction at residential sources, although they may also be applied to commercial (including multi-family dwellings) and industrial waste generators.

The current residential rate structure assesses the same price per gallon of refuse removed for 64 gallon toter cans and 110 gallon toter cans. While this rate structure does not encourage wastefulness by providing a lower price per gallon removed for larger volumes, it does not serve as strong disincentive to waste disposal. Further, there are no provisions in the current rate to reward the generators of small quantities of waste.

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

Possible variations to the rate structure alternative are:

- Use of a base subscription fee to cover fixed collection costs plus a flat per unit volume charge.
- A mini-can rate to encourage reduced volume.
- Fees that rise according to increasing volume.
- Fees that are essentially flat by volume.
- Charges based upon weight instead of volume.

Implementation of quantity-based variable rates or user fees may require the purchase of new collection equipment, including: trucks, retro-fit dumping equipment, on-board scales, bar coding equipment, stickers, bags, etc.

Most systems that currently charge a variable fee do so according to volume. The City of

Seattle has a well-developed program using this approach. However, given that not every container is necessarily full and the densities of some wastes are different from others, the argument has been made that weight-based systems would be more equitable. Some communities, such as Seattle, are experimenting with these systems; they require more collection time and require the collection vehicle to have a scale and a bar-code reader to read the homeowner's account number from the container.

Cities implementing variable rate programs have frequently found that they do result in reduced quantities of waste; therefore, the revenues generated by the collection are often overestimated and insufficient to cover the fixed costs of the hauler. The solution to this problem is the use of a fixed subscription fee to cover fixed costs, plus a variable rate fee for the actual quantities of waste collected.

Variable rate fees that rise rapidly with increasing volume tend to place a strong economic incentive upon reducing the amount of waste. Variable rate structures thus provide an excellent impetus for participation in recycling and yard waste programs. In fact, it is very important that recycling and yard waste programs be provided in conjunction with a quantity-based collection rate structure to provide alternatives to standard waste collection and disposal. Furthermore, variable rate structures may require both anti-dumping ordinances and anti-scavenging ordinances to deter these activities as the variable rates and the recycling programs will tend to provide incentives for both dumping and scavenging.

This alternative is directed towards residential and household waste generators. Materials targeted for source reduction by this alternative include: paper and plastic packaging, disposable products (pens, diapers, etc.), food waste, yard waste, and wood.

Effectiveness

Rate structure modifications provide financial incentives to residents to reduce the amount of solid waste generated in the home. Residents will 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. Reduced volume through increased compacting is expected as residents increase the amount of material placed into trash containers. Additionally, variable rate structures provide an incentive for increased participation in recycling and community composting programs.

Participation and reduction rates are sensitive to the impact of other alternatives such as public education and awareness programs, expansion of curbside and commercial programs, mandatory recycling laws and separate yard waste collection.

Monitoring can be done in general terms by measuring changes in gate tonnages and by volume reduction estimates provided by the hauler. The quantification of diversion for specific material types through a variable rate program is generally not possible. It would be difficult at best to determine diversion for materials which would not have been generated in the first place.

Therefore, no specific types of materials are targeted for measurement and no diversion credit is anticipated to be claimed through this program.

Hazards

No direct environmental hazards are associated with rate structure modifications. However, increased rates for garbage collection may result in illegal dumping, both on public property and in the disposal containers of commercial businesses. Dumping on open, private, or public property can result in environmental and public health hazards. Further, economic incentives to participate in curbside programs may result in more unacceptable materials being placed at the curb for collection and subsequently rejected by the route collector, thereby increasing the potential for litter.

Ability to Accommodate Change

Rate structure modifications can require review, public hearings and independent cost and feasibility studies. Generally speaking, rate changes are met with public resistance. It is, therefore, in the City's interest to structure rates so as to be flexible and require review no more often than is absolutely necessary.

Consequences on Waste Stream Composition

This alternative will reduce the amount of solid waste generated, and consequently the amount of waste going to landfills. In addition, variable rate structures provide a strong incentive to separate and divert items from the waste stream when other programs are available; therefore, this alternative will be most effective in conjunction with both recycling programs and yard waste composting programs. Additionally, this alternative (if volume-based) may result in increased use of compactors, resulting in a more dense waste stream which would be more difficult to sort after collection.

Ability to be Implemented

Changes to rate structure will require the approval of the appropriate agency such as the City Council or other regulatory body and may require public hearings and extensive review. Implementation may take as long as 6 to 18 months from the time the decision is made to begin rate review.

Need for Facilities

No additional facilities are required for implementation of this alternative. It is assumed that the present facilities will be able to include those items of additional equipment that may need to be accommodated by the program. However, recycling and composting programs that complement this alternative will require facilities.

Consistency with Local Policies, Plans, and Ordinances

While there appear to be no local policies or ordinances prohibiting a change in rate structure, the franchise agreement with the City's waste hauler which may require amendments or renegotiation.

Institutional Barriers to Implementation
No institutional barriers exist which would pose a barrier to implementation.

Costs
Implementation of this alternative requires (1) a rate study to determine appropriate rate structures for achieving the desired level of source reduction; (2) a determination of whether the proposed rate would support the fixed and variable costs of collection and disposal, once source reduction has begun; (3) review and approval by the regulatory bodies (including a public hearing); (4) generation of informational and educational materials; and (5) modification of existing billing operations.

Estimated costs could range between $40,000 to $60,000 for a rate study and program design. In addition, information explaining the rate structure changes will have to be distributed to educate the public about the new rates and the availability of recycling alternatives. An estimated 80-120 hours of staff time will also need to be allocated to develop, implement, and monitor the rate increases. Finally, should a variable can rate alternative be selected, additional costs may be required to purchase standardized refuse containers acceptable for the program. Container costs can range from $10 to $70 per container depending upon capacity and quality. Container costs could be as high as $600,000 depending upon program design.

Market Availability
Markets are not necessary for this alternative.

Public Acceptance
The change from a fixed fee system to a variable rate system, especially in conjunction with other source reduction or diversion programs (recycling and yard waste programs), will entail a great deal of effort on the part of the city and the hauler to prepare the public for the new system, explain how it works, that it is both necessary and equitable, and how it can be conveniently adapted to. Initial public resistance can be mitigated if there is a strong perception that the program is necessary, fair, and results in equal or better service. If the variable rate structure is to be implemented in conjunction with recycling and yard waste programs, it is possible to make these changes in the short term and yet allow time for the public to make adjustments in their behavior.

## Economic Incentives

### Alternative 2. Loans, Loan Guarantees, Grants and Contributions

Loans, loan guarantees, grants, and contributions enhance the effectiveness of other programs and alternatives. Under this alternative, the City would provide loan guarantees or actual loans or grants to encourage the economic development of businesses, nonprofit groups, or associations that promote source reduction or otherwise encourage waste reduction. In addition,

the city can also lend its support in exploring and developing other funding sources such as grants, industry financial support, in-kind support (donations of composting bins or use of facilities for workshop seminars), and private foundation contributions to be used in developing and implementing source reduction methods.

The City may determine that a particular entity qualifies for financial assistance if that entity's program(s) will further the interests of local source reduction efforts. The entity in question might fulfill a role within the community that supports other community programs such as public education, source reduction awareness efforts, and any other aspect or component of the overall waste reduction effort. For example, a community could provide a grant to the local chapter of the Boy Scouts or a community recycling organization to develop and implement composting workshops. These workshops could be scheduled one weekend a month and be timed to coincide with the beginning of other programs and alternatives, such as variable disposal rates and backyard composting programs. The community could also provide funding and meeting rooms for workshops on source reduction techniques given by local chapters of conservation groups for the managers of commercial procurement programs.

This alternative emphasizes the provision of nominal amounts of support to facilitate the primarily volunteer efforts of local or regional groups and associations seeking to foster source reduction efforts at the community level. The City can provide both physical resources and financial assistance to defray some of the costs of providing technical assistance and public education offered by these groups. Through this alternative the City can forge a relationship and working partnership with volunteer and community interest groups and associations who seek to further community waste management goals and objectives. This alternative enables the city to take advantage of the expertise and resources of what are essentially volunteer groups.

Effectiveness

This alternative can be highly effective because (1) it requires relatively small financial outlays from the City for staff and physical resources; (2) it makes use of the in-house expertise and skill of the City staff in researching and developing other funding sources for volunteer or community groups; and (3) it allows the City to better utilize the existing resources of the community in terms of expertise and organizational support for community source reduction efforts and policies. In the field of waste management, and especially in changing individual generator and household behavior, this kind of an alliance between community groups and waste management authorities is invaluable.

Hazards

No environmental hazards are created by this alternative.

Ability to Accommodate Change

This alternative can be developed and/or administered to be very flexible because it relies on existing community groups that are interested in promoting source reduction efforts through public awareness and technical assistance. As the community, the waste management system,

and the waste stream change over time, the expertise and ability of these groups will change also. New techniques and approaches will become available to the City by virtue of the informal relationship between the public agencies and these community groups. This alternative's funding mechanism seeks to capitalize upon the stock of community knowledge and expertise existing at any point in time. Thus, this alternative is easily adaptable to change as new methods and programs are developed.

Consequences on Waste Stream Composition

Direct community support for carefully implemented programs will reduce the amount of solid waste discarded. Changes in the waste stream composition will depend on the materials targeted for reduction by the programs supported and implemented. The most likely candidates for the support provided by this alternative are backyard composting programs, commercial purchasing and procurement programs, office source reduction programs, and consumer purchasing awareness programs. The waste stream materials affected by these types of programs are yard wastes and wood cuttings, office paper and plastic packaging, corrugated cardboard, and other packaging products.

Ability to be Implemented

This alternative can be implemented within the short-term planning period.

Need for Facilities

No facilities are required for this alternative.

Consistency with Local Policies, Plans, and Ordinances

This alternative presents no direct conflicts with current policies, nonfinancial related plans, and ordinances.

Institutional Barriers to Implementation

No institutional barriers exist which would limit implementation of this alternative.

Costs

The costs of this alternative would involve the use of City staff resources to develop and administer the program. The program is assumed to fund at most ten loans, grants, etc. each year. Staff time of approximately 120 hours per year might be required to develop, approve, implement, and administer each community project funded. For projects in which staff assist community groups to obtain alternative funding from other sources (State, trade associations, foundations), an additional 80 hours might be required. Other costs include the direct dollar amount of any grants or funding provided by the City. Generally, these operating grants might be provided funds anywhere from $1,000 to $2,500 and would not be expected to exceed a maximum of $4,500. Total cost for this option is from $4,000 to $7,500 per grant or loan.

Market Availability

No markets are required for this alternative.

Public Acceptance
High profile and high impact programs using well-known and respected community groups may gain rapid public acceptance and promote public involvement.

Regional Applicability
This alternative lends itself particularly well to a regional approach. This would allow for an excellent working and problem-solving relationship to develop, and would take advantage of the presence of many community groups in the County.

Alternative 3. Commercial Business Compliance Programs

Under this alternative the City would require the development and implementation of source reduction programs and practices in local businesses by requiring businesses to complete a short document providing data and information on their waste streams and outlining their present and proposed source reduction practices as part of their business license application. Technical assistance could be provided to businesses for this program in the form of a pamphlet and informational flyer describing the kinds of data and information sought by the City and the financial and other benefits, i.e., health of worker environment, that could accrue to the business.

Through this alternative the City could require waste reduction planning and reporting requirements for large commercial or institutional waste generators that are similar to what the State of California has required of Cities and Counties. Thus the City would delegate the responsibility for implementing source reduction programs to the larger waste generators in the community. These entities would be held responsible for developing and implementing a plan that reduces the amount of waste generated through source reduction (as well as recycling and composting) that helps the City satisfies the required diversion requirements of AB 939. Like the City itself, these businesses would report their progress regularly through business license renewal or means.

Effectiveness
This alternative could be very effective as it would eventually assess a penalty on businesses that do not participate in waste reduction efforts, thus providing an economic incentive to develop and implement a source reduction program.

Hazards
No hazards are associated with this alternative.

Ability to Accommodate Change
This alternative is readily adaptable to changes in available source reduction technologies and applications. As newer types of manufacturing, processing equipment, packaging or new formats for marketing products become available, this alternative allows businesses to take

advantage of them in their procurement planning. As waste reduction practices and waste streams change over time, this alternative will incorporate those changes readily and with little additional effort on the part of either the public or private sector.

Consequences on Waste Stream Composition

Carefully implemented programs will reduce the amount of solid waste disposed of at landfills. Changes in the waste stream composition will depend on the types of businesses that comply and the materials targeted for reduction by the programs they implement. Changes in the waste stream composition will also depend on the availability of alternative products and on the effectiveness of these procurement programs on the materials targeted for reduction. The most likely materials targeted for reduction are paper and corrugated cardboard packaging, plastic packaging material, and other packaging products.

Ability to be Implemented

This alternative could be implemented in the short-term planning period.

Need for Facilities

No facilities are required by the City for this alternative. The extent that businesses would require additional or modified facilities to comply with the program cannot be determined at this time.

Consistency with Local Policies, Plans, and Ordinances

This alternative would require new City policies or ordinances.

Institutional Barriers to Implementation

Implementing a program to penalize businesses not complying with waste reduction and planning requirements of this alternative would probably require the involvement of more than one public agencies within the City. For example, the agency collecting the fees (the Tax Assessor) might be different from the agency tracking the forms themselves. This could delay implementation and lead to additional cost and administrative burden. Some degree of coordination between public agencies would be necessary to ensure that businesses not filing forms were assessed the fine and that businesses attempting to comply with the reporting requirements could do so in the course of making regular business filings and payments.

This program will impact existing plans, budgets and policies of businesses.

Costs

The costs associated with this alternative will be primarily staff time necessary to develop and administer the program. Potentially this program could require staffing by the City. Costs for the businesses required to evaluate their waste stream and develop and implement source reduction programs cannot be determined at this time. However, businesses will benefit from these efforts as a result of lower disposal costs as well as potential cost savings in procurement. Estimated program costs range from $15,000 to $20,000 per year to develop and maintain this

program.

Fees can be collected by staff who currently collect business license fees. The tracking of the waste reduction and planning forms could be adapted to the processes currently used to monitor business compliance with other local regulations.

There can be considerable investment costs associated with businesses implementing the source reduction measures in new and modified facilities and equipment.

Market Availability
Markets are not required for this alternative.

Public Acceptance
This type of program may be accepted by the public, and the business community in particular, if the program requirements are presented as part of the cost of responsible business practices. Therefore, those being penalized are assumed not to be in compliance with responsible waste management practices. Furthermore, every effort should be made to ensure that the reporting process is brief, provides only the level of data and detail useful to the City, and is easily complied with through regular channels between businesses and the City.

Technical Assistance

Alternative 4. Waste Evaluations and Waste Minimization

This alternative requires the City to assist selected, larger, commercial/industrial generators in the community to conduct waste evaluations to identify what types and amounts of wastes are being generated and to assist them in identifying and implementing waste minimization techniques. Waste evaluations might be restricted to certain categories of commercial generators according to the Standard Industrial Code, employee size, or by the quantity and type of wastes known to be generated by those enterprises. Restricting, or selecting, the number of entities that must complete these evaluations allows the community to reduce the administrative burden and cost to both the public and private sectors. Additionally, restricting the scope of this program enables the community to ensure greater compliance by focusing on larger generators contributing significantly to the waste stream.

Data collected from the waste evaluations could be used for several purposes: (1) assessing proper waste disposal fees; (2) controlling the disposal of banned wastes into the waste stream; and (3) establishing a waste generation database from which to measure future progress in waste reduction. These evaluations could be required periodically to provide information on the generator's progress.

This alternative could be required of the selected waste generators as a provision of their

permitting, licensing or waste disposal contract (i.e., waste haulers would not be allowed to collect or dispose of wastes generated by entities not meeting certain criteria after a given date). The program could also be voluntary. The waste evaluations could be funded by the generator or be partially funded by the community as a service or through a grant program (see Alternative 2). The primary purpose of the waste evaluation alternative is to increase commercial/industrial awareness of the need for, and benefits of, waste reduction programs and to assist businesses to design and implement programs reducing waste generation.

Effectiveness

This alternative can be effective because it seeks to target a limited number of large waste generators. This alternative reinforces other educational and awareness programs and will generate baseline data on commercial wastes in the community. Furthermore, because of the smaller number of entities and the high contribution to the waste stream, the impact of source reduction programs aimed at these entities can be significant while the administrative burden and cost minimal.

The effectiveness of this alternative would be based on the criteria that the City uses to select the participants and the materials generated by each facility. As such, the effectiveness of this alternative is difficult to quantify.

Hazards

No hazards are created by this alternative.

Ability to Accommodate Change

This alternative readily accommodates change in the stock of generators, the types and quantities of wastes generated, and in the City who would administer the program. This alternative provides a mechanism for measuring change in the waste stream and the impact of source reduction programs on commercial generators. This alternative also develops baseline data on commercial wastes and allows public agencies to make decisions based upon the impact of local programs.

Consequences on Waste Stream Composition

This alternative has no direct effect on the waste stream. However, the alternative provides the data and awareness necessary to implement commercial source reduction programs. The secondary impact of this alternative, therefore, may be a reduction of the materials cited above as being most likely to respond to source reduction efforts.

Ability to be Implemented

This alternative can be implemented in the short term planning period.

Need for Facilities

No facilities are required for this alternative.

Consistency with Local Policies, Plans, and Ordinances
This alternative presents no direct conflicts with current policies, plans, and ordinances.

Institutional Barriers to Implementation
To require the waste evaluations, the City must ensure that it has the proper authority to do so, including making the evaluation a part of either the business license renewal or the waste disposal contract for the generator. Additionally, a public agency and staff must be designated to oversee the program, ensure compliance, and collect and process the resulting data.

Costs
The costs for this alternative depend on the level of information collected in the waste evaluation. Requiring a full-scale waste characterization study by the larger commercial generators would be prohibitively expensive and probably unnecessary. The wealth of data generated by such an effort might not be required to meet the main goals of this alternative, which are to increase awareness of the need for commercial source reduction efforts and to generate data on local commercial waste streams. The City should structure the requirements of this alternative so that target generators can conduct the waste evaluation using in-house staff and expertise, if possible. If necessary, resources may be required for outside consultant services. The overall costs of this alternative should be in the range of 40 to 80 hours for one member of the generator's staff and two to four hours of a City staff member's time. Additional staff time would be needed to process the data from the waste evaluation.

Market Availability
Markets are not necessary for this alternative.

Alternative 5. Backyard Composting Programs (Selected)

This alternative involves developing programs to encourage backyard composting of yard and food waste by homeowners. Food wastes are a significant component of the residential waste stream; therefore, source reduction programs targeting food and yard wastes can significantly affect the amount of waste going to landfills.

This alternative focuses on residential yard and food waste (green waste) composting programs, defined as composting activity taking place on the property of homeowners. This alternative could also focus on commercial and institutional generators of yard waste, including public agencies. Although residential generators contribute a significant proportion of green waste to the waste stream, they are also more numerous and may require regulatory and economic incentives as well as educational and technical assistance programs to encourage participation. Institutional generators, however, are fewer in number and often have commercial grounds management services to whom yard waste responsibilities could be delegated.

This program would encourage all generators of yard wastes, especially homeowners, to separate

their food and yard wastes from the waste stream and reuse these wastes through composting. The City can foster this approach through a number of activities designed to support backyard composting, as illustrated in the following examples.

- Develop a "Master Composter" program establishing a network of community volunteers to provide workshops and increase awareness of backyard composting.
- Provide yard waste generators with low-cost bins designed for composting and a flyer describing how to compost.
- Enact an ordinance banning green wastes from the waste stream.
- Require all grounds-keeping and other landscape maintenance companies operating within the City to provide a composting service to their customers.

The fundamental premise of this alternative is that yard waste does not enter the waste stream at any time.

Effectiveness

This program would likely target food waste and yard waste which is currently collected source separated at curbside. Assuming that a diversion rate of 10 to 15 percent can be realized, this program would result in an overall diversion rate of 1.5 percent of all waste generated in the City.

Hazards

The City may seek to ensure through educational programs that proper composting techniques are used so that no public health or fire hazards are created. For example, if backyard composting is encouraged, especially with food wastes, the potential exists for rodents, odors, and other health concerns. Education programs will have to be undertaken to ensure proper composting methods are used.

Ability to Accommodate Change

This alternative can easily be changed to meet new conditions and situations. This alternative could be adopted and developed and then subsequently changed in size and scope to accommodate changing needs for yard waste reduction and ability to support technical assistance and education programs.

Consequences on Waste Stream Composition

This alternative will alter the mix of organic material in the waste stream as well as the total quantity of waste discarded. The amount of yard waste in the waste stream could decrease by as much as 20 percent, depending on the effectiveness of the yard waste program. The Btu value and the biodegradability of the waste stream may be reduced, potentially effecting possible future incineration options and/or methane production.

Ability to be Implemented
This alternative could be implemented in the short-term planning period. Combining disposal/dumping bans, fees, and public education and technical assistance programs could result in a highly effective program within one year.

Need for Facilities
There are no facility requirements for this alternative.

Consistency with Local Policies, Plans, and Ordinances
This alternative presents no direct conflicts with current policies, plans, or ordinances.

Institutional Barriers to Implementation
There are no institutional barriers to the implementation of this alternative.

Costs
The costs of this alternative include the expenses for a public awareness and technical assistance program, as well as a subsidy for part of the cost of composting bins to homeowners (perhaps $20 per bin).

Public awareness program costs would vary depending on the scope of the program and the tools used to convey the message. Program expenditures might include:

- Pamphlets and flyers for each household (10 to 25 cents each).
- Door hangers (10 to 25 cents each).
- Public service notices placed in utility bills (5 to 10 cents each).
- Staff resources to develop, implement, and monitor the program (200 hours).

Market Availability
It is assumed that the compost is used by the generator.

Alternative 6. Educational Efforts (Also refer to public education component)

This alternative involves (1) educating the public about the need for, and the benefits of, source reduction, and (2) providing information to the public on ways to actually implement source reduction techniques in their personal and business activities. This alternative involves developing and/or sponsoring consumer awareness programs, school curricula, seminars, and public forums that will increase awareness of the solid waste problem, the economic and

environmental benefits of source reduction programs, and of any regulatory requirements that require certain types of source reduction activities. For example, this alternative may also seek to change consumer purchasing patterns to reflect source reduction concerns, by introducing the concepts of "bulk shopping" and "product substitution" to the community.

This alternative requires the City to act as a catalyst for source reduction efforts within the community. The City would serve as a clearinghouse for information on source reduction techniques and provide a means for different segments of the community (public and private, residential, and commercial) to gain structured access to each other to promote the rapid and effective expansion of source reduction activities. For example, the City could provide businesses with specific methods and techniques on how to reduce waste disposal by creating office procedures which minimize the amount of waste paper generated. Source reduction pointers ranging from procurement practices to the use of double-sided copying and using waste paper as scratch paper, could also be provided to the community. Consumer organizations could be encouraged to meet with businesses to develop different approaches to product retailing. Businesses engaged in promoting source reduction (such as bulk-purchase stores or stores catering to yard waste composting activities) could be offered the opportunity to conduct a workshop or seminar.

This alternative is vital to the success of other source reduction alternatives, such as yard waste composting, and is linked in scope and purpose to Alternative 2 on grant funding for community groups seeking to participate in the community's source reduction efforts.

Educational efforts should target all waste generators within the City, including businesses, homeowners, and the general public. Materials targeted for source reduction include: paper products and packaging, plastic products and packaging, food waste, yard waste, wood, nonrecyclable packaging and containers, disposable products such as pens, razors, cameras, beverage containers, disposable diapers, car tires, batteries, and appliances.

Effectiveness

Education can be highly effective relative to dollars spent because (1) it potentially requires only nominal financial outlays from the City and (2) it allows the City to fully utilize the existing resources of the community in terms of expertise and organizational support for community source reduction efforts and policies. In the field of waste management, and especially in changing individual generator and household behavior, this kind of cooperative support between public agencies, community groups, households, and commercial waste generators is invaluable.

Educational programs alone can produce source reduction results; however, such programs are most effective when used to enhance the effectiveness of other source reduction programs in the community.

Hazards

No hazards are created by this alternative.

Ability to Accommodate Change

This alternative is very flexible because it relies on existing community resources in encouraging source reduction efforts through public awareness and technical assistance. As the community, the waste management system, and the waste stream itself change over time, the expertise and abilities of community resources will change also. New techniques and approaches will become available to the City by virtue of the informal relationship between public agencies, businesses, households, and community groups. This alternative is easily adaptable to change as new methods and programs are developed.

This alternative also readily accommodates changes in the waste stream as well as changes in consumer purchasing behavior and available products and alternatives. Indeed, once the public is sensitized to the City's program of heightened environmental awareness, it may in fact be easier to introduce new concepts to further change public behavior.

Consequences on Waste Stream Composition

Direct community and business involvement and participation in carefully implemented programs will reduce the amount of solid waste discarded. Changes in waste stream composition will depend on the effectiveness of the public education effort and on the materials targeted for reduction by those responding to the message of these programs. The most likely areas for significant impact would be programs aimed at backyard composting, commercial purchasing and procurement programs, office source reduction, and consumer purchasing awareness. The waste stream materials that are anticipated to be most affected by these types of programs are yard wastes and wood cuttings, office paper, plastic packaging, corrugated cardboard, other packaging products, and disposable products.

Ability to be Implemented

This alternative can provide a range of options with respect to the scope and duration of the public education effort. Therefore, initial public education efforts can be implemented in the short term. These might include public forums, workshops, flyers, and doorhangers. More involved programs, such as school curricula, could be developed and implemented over the medium term.

Need for Facilities

This alternative requires no facilities.

Consistency with Local Policies, Plans, and Ordinances

This alternative presents no direct conflicts with current policies, plans, or ordinances.

Institutional Barriers to Implementation

This alternative presents no institutional barriers.

Costs

The cost of this alternative will vary dramatically depending upon the scope of implementation.

However, many of the other source reduction alternatives, as well as recycling and community composting programs, will depend upon an aggressive and successful public education program. The costs of this alternative would include the use of City staff resources to develop and administer the program. In addition, there will be costs associated with promotional brochures, pamphlets, flyers, doorhangers, and production costs for any use of the media or outside consultants. For a more detailed analysis of costs, please refer to the Education Component (Section 8) of this SRRE.

Market Availability
Markets are not required for this program.

Regional Applicability
Public education programs may be appropriately implemented regionally. For example, elements of a source reduction awareness program might include public service messages on radio or television stations; advertisements and press releases might be included in publications with a circulation covering the City and the area surrounding Woodland.

Alternative 7. Awards and Public Recognition (Selected)

This alternative involves generating public support for source reduction efforts on the part of business and private individuals by recognizing individuals, groups, or businesses that actively engage in source reduction and/or minimization efforts and that support the community's source reduction programs. This alternative serves as a complement to other source reduction alternatives such as public education, technical assistance, and grant programs and may involve other local community organizations such as the Boy Scouts, Girl Scouts, Rotary Club, Lions' Club, the PTA, and local police and fire fighters youth associations.

Effectiveness
No diversion occurs directly as a result of this program. However, the effectiveness of other diversion programs may be increased slightly.

Hazards
No hazards are created by this alternative.

Ability to Accommodate Change
This alternative easily adapts to new circumstances within the City. 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 on Waste Stream Composition
This alternative will have negligible consequences on the waste stream.

Ability to be Implemented
This alternative can be implemented in the short-term planning period.

Need for Facilities
This alternative requires no facilities.

Consistency with Local Policies, Plans, and Ordinances
This alternative presents no direct conflicts with current policies, plans, or ordinances.

Institutional Barriers to Implementation
There are no institutional barriers to implementation of this alternative.

Costs
This alternative may involve publicity and public relations costs associated with awarding recognition and highlighting specific activities within the community. These costs will most likely take the form of expenses for printed media publicity. Some of the exposure necessary for these kinds of recognition programs can be gained free in the form of press coverage of officially sanctioned events sponsored by the City. If awards or prizes of any inherent value are planned (e.g., cash awards), these costs will need to be considered also. In addition, the sponsoring agency for the programs under this alternative will incur the cost of developing and administering the programs. This option can be implemented for the cost of a plaque and staff time to issue a press release and award the plaque. Details related to the implementation of the program are given in Table 4-8.

Market Availability
Markets are not required for this alternative.

Public Acceptance
Public recognition programs are an accepted means of generating public support for, and greater awareness of a community campaign. This is a common tactic in campaigns focusing on health and welfare issues such as blood drives, donations for homeless and indigent citizens, and support for populations such as children or the elderly. Programs to achieve similar results for source reduction programs will find a high degree of public acceptance.

Regional Applicability
Public recognition programs may be appropriately implemented over a regional area encompassing the City. For example, a regional recognition program for businesses implementing source reduction programs might include public service messages on radio or television stations; awards, announcements, and press releases might be included in publications with a circulation covering the City. Both of these examples would make it worthwhile for the City to combine their efforts for these elements of their programs.

Alternative 8. Nonprocurement Source Reduction Programs By Local Government (Selected)

Nonprocurement programs involve all methods to implement source reduction that are not associated with purchasing decisions. This alternative requires the local governments to undertake a number of programs aimed at altering the behavior of personnel and the operations to reduce the amount of waste generated on a day-to-day basis. These programs could include education programs familiarizing people with source reduction practices such as: double-sided copying, increasing the use of scratch paper, making fewer drafts of reports, using electronic mail, and so on. This alternative provides an opportunity for the City itself to develop and implement a model source reduction program that can be used as an example for private, public, and commercial entities in the area.

This alternative targets the City's administrative offices and their use of paper; however, other materials may be targeted as well.

Effectiveness

The waste generation study does not provide waste data for governmental offices and operations in the City; however, it is reasonable to assume that these wastes are paper and that the source reduction programs outlined above could reduce this amount by up to 20 percent.

Hazards

No hazards are associated with this alternative.

Ability to Accommodate Change

This alternative is readily adaptable to change. In-house source reduction policies and programs for the City can be altered to accommodate changes in available source reduction technologies and processes (procurement programs), changes in the waste stream itself (shifts in the ratio of paper to plastic, etc.), and changes in the emphasis of various source reduction programs by the City.

Consequences on Waste Stream Composition

Direct support by the City for carefully implemented programs will reduce the amount of solid waste discarded. Changes in waste stream composition will depend on the effectiveness of employee education efforts and on the materials targeted for reduction. The most likely areas for significant impact would be from programs aimed at office source reduction programs, primarily paper. The waste stream materials affected by these types of programs are yard wastes and wood cuttings, office paper and plastic packaging, corrugated cardboard, and other packaging products.

Ability to be Implemented

This alternative can be implemented within the short-term planning period.

Need for Facilities
This alternative requires no facilities.

Consistency with Local Policies, Plans, and Ordinances
This alternative presents no direct conflicts with current policies, plans, or ordinances.

Institutional Barriers to Implementation
No institutional barriers are associated with this alternative.

Costs
The primary cost will be for staff time to develop and implement a source reduction policy and program for the City. Some costs will be incurred in preparing and disseminating informational materials to staff, perhaps in the form of pamphlets or flyers posted at appropriate places in the work place. The primary emphasis of this nonprocurement alternative is to change government employee behavior mainly with respect to the use and disposal of paper, plastic, and cardboard products. The costs associated with this alternative are therefore similar to those for developing and implementing any kind of awareness program within an institutional setting, and are assumed to be relatively small. The City would prove valuable in taking the lead in such a program. Details on program costs are presented in Table 4-9.

Market Availability
Markets are not required for this alternative.

Regulatory Programs

Alternative 9. Adoption of Government Procurement Policies (Selected)

This alternative involves the City adopting procurement policies that include the following criteria for purchasing decisions: durability, recyclability, reusability, and recycled material content. The City could adopt purchasing preferences for recycled products as a part of this program; however, this would not qualify as "source reduction."

This alternative targets the materials used by administrative offices, as well as equipment purchased by other operations such as police, public works, etc. Materials that will be diverted through source reduction include: paper products and packaging, plastic products and packaging, all disposable items, stationery, office supplies, tires, batteries, and food service items.

Effectiveness
The waste generation study does not provide waste data for governmental offices and operations in the City; however, it is reasonable to assume that these wastes are paper and that the source reduction programs outlined above could reduce this amount by up to 20 percent.

Hazards
No hazards are anticipated by implementation of this alternative.

Ability to Accommodate Change
This alternative is readily adaptable to changes in available source reduction technologies and target materials. As new, more environmentally sound, products and packaging become available, the City will be able to take advantage of them, setting an example for the community.

Consequences on Waste Stream Composition
Direct participation by the City in a carefully implemented procurement program will reduce the amount of solid waste generated. Changes in waste stream composition will depend on targeted materials and the availability of alternative products. The most likely materials reduced in the waste stream would be paper and corrugated cardboard packaging, plastic packaging material, other packaging materials, disposable products, and products with relatively short useful lives.

Ability to be Implemented
This alternative can begin to be implemented relatively quickly, although full implementation will require the development of a detailed policy which identifies target materials, product criteria, and suggested product options and alternatives.

Need for Facilities
No facilities are required for this alternative.

Consistency with Local Policies, Plans, and Ordinances
This alternative would require the adoption of a City procurement ordinance or policy.

Institutional Barriers to Implementation
Purchasing and procurement programs within the City's many public agencies will require coordination in order to achieve city-wide source reduction. While purchasing itself is often centralized within a City's operations, the individual agencies receiving or consuming the goods and services purchased must be fully aware of the program's purpose and assist in identifying products and materials for which alternatives are available. Again, the City could take the lead in the coordination of purchasing policies.

Costs
The costs for this alternative are primarily in staff time to develop purchasing guidelines and identify appropriate substitute products. Additional primary expenditures will be significant in the initial purchasing with more durable, more expensive products to replace those currently in use. These expenditures, however, impact cash flow and can be budgeted to be recouped. Details on costs are presented in Table 4-10.

Market Availability
Markets are not required for this alternative.

Alternative 10. Product Bans

The City may ban targeted products and packaging techniques to reduce waste at the source and provide a net environmental benefit. Bans might be considered on products and packaging that do not lend themselves to recycling or source reduction. The criteria for product bans are similar to those used to determine the applicability of advance disposal fees; the product must be disposable or difficult to reuse or recycle and must have environmentally sound substitutes (such as disposable razors, nonrefillable pens, nonreusable beverage containers). For example, some communities (Berkeley, California) have banned polystyrene foam packaging from fast food restaurants. Other communities have banned items such as nonrecyclable 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 residential and commercial consumers to adjust to the policy and identify substitutes.

Effectiveness

Product bans are generally not effective or well received on a local level as residents see them as intrusive and will therefore simply drive to a neighboring jurisdiction to buy the banned product.

Hazards

This alternative presents no known environmental hazards, although it is critical that the substitute for a banned product has a less significant environmental impact than the banned product.

Ability to Accommodate Change

A product ban, while it is in force, can not respond to changes in the market. Additionally, a product ban clearly forces manufacturers, retailers, and consumers to search for alternatives to the banned product. This can take a significant amount of time. Once in place, banned products will have lost their place in the market or will not likely be brought back if the ban were to be removed.

Consequences on Waste Stream Composition

A product ban may significantly reduce the quantities of the banned product in the waste stream. However, the ban may also increase the presence of product substitutes in the waste stream. The effect of product substitutes must be carefully considered. When implementing a product ban, it is important to ensure that the substitutes do not themselves present problems involving increased volumes or toxicities of wastes going into landfills.

Ability to be Implemented

A product ban can be implemented in the short term. However, the surrounding body must allow for some period of time for consumers, producers, and retailers to adjust to the effects of the ban.

Need for Facilities
No facilities are required for this alternative.

Consistency with Local Policies, Plans, and Ordinances
This alternative may conflict with prevailing local policies.

Institutional Barriers to Implementation
No institutional barriers are presented by this alternative, although there may be legal ramifications associated with excluding a product from the market through a product ban.

Costs
The cost of this alternative includes staff time necessary to develop, review, and present for approval by the appropriate forum, the details associated with implementation of a product ban. Costs to local merchants, consumers, and producers are unknown.

Market Availability
No markets are required for this alternative.

Public Acceptance
A product ban can meet with significant resistance if the proposal is not carefully designed and implemented. This alternative not only involves changing behavior on the part of the consumer, but also changing the manufacture and marketing of a product or its substitute. These changes can result in real costs to retailers, manufacturers, and consumers, and these costs will have to be carefully explained and justified. The City should be able to clearly identify the environmental benefits to the community from this type of regulatory alternative before implementation.

Regional Applicability
Because of the broad nature of this alternative and the impact it has on an entire market area for a product, it is often more effective to implement a product ban on a larger geographic scale such as a region or a county. When considering this alternative, the City should investigate implementing such a program in conjunction with neighboring jurisdictions.

## 4.4 SELECTION OF PROGRAMS

This section summarizes the programs selected by the City for implementation during the short and medium term planning periods. Program selection decisions are based upon discussions with City personnel and the programs applicability to the City of Woodland. A discussion of each of the alternatives is provided below:

### 4.4.1 Selected Programs

Existing Programs

The existing programs include source reduction activity occurring within businesses. These activities are expected to continue throughout the planning period. While the City does not have direct control over these types of facilities, the City will devise methods to quantify the waste currently diverted through source reduction.

Alternative 1. Quantity Based Variable Rates or User Fees

This alternative has been selected for implementation as a contingency measure in the event that the City falls short of meeting its diversion goals. Because the City's current refuse collection rate is incorporated into a larger utility user fee and is not variable, a rate study will first be conducted to determine the impact of severing the refuse fee from the utility rate. Because many steps are involved in such a rate restructuring and the short term integrated waste management costs are as yet undetermined, the City will examine the feasibility of implementation in the medium-term planning period with attention to the introduction of a mini-can rate for the highly successful recyclers, composters and source reducers.

Alternative 5. Backyard Composting

Backyard composting is selected for short-term implementation as a source reduction program. The City will seek to attain a 10 percent participation rate by all City residents by 1995 and up to 15 percent by the medium-term planning period. Expected diversion is anticipated to be approximately 1.5 percent of the total waste stream. Backyard composting will be promoted through public education, yard waste collection program information, and the Master Composter Program to assist in education, training and monitoring of diversion.

Alternative 6. Educational Programs

This alternative has been selected for implementation in the short-term. As goals, the City will target source reduction awareness levels of 60 percent of City residents and businesses by 1995 and 90 percent by the year 2000. Source reduction options for residential and commercial waste generators will be incorporated into education and public information materials.
See Section 8 - Education and Public Information Component.

Alternative 7. Awards and Public Recognition

This alternative has been selected for implementation on the short term and will focus on promotion of source reduction, curbside recycling, and yard waste collection programs. The City will recognize an awards program and will seek proper venues to actively give out awards. Local papers will be encouraged to include articles about local individuals or companies who have effective recycling and source reduction programs. No direct diversion may be attributable to an awards program.

Alternative 8. Government Non-Procurement Source Reduction Policies

This alternative has been selected for implementation in the short term planning period and will target materials in the local government's waste streams. The primary goal will be to improve the efficiency of office paper use by 25 percent in 1995 and 40 percent by the year 2000. This alternative will allow the City to take the lead in setting an example for source reduction programs.

Alternative 9. Government Procurement Policies

This alternative has been selected for implementation in the short term. The City will pass an ordinance mandating that City procurement practices consider durability, recyclability, recycled content and environmental impact on all purchasing decisions.

### 4.4.2 Anticipated Diversion Through Source Reduction Program Implementation

With the exception of Backyard Composting the quantity of waste which can be diverted through selected source reduction programs cannot be quantified with available information. Estimates of the quantity of waste diverted through backyard composting programs are approximately 1.0 and 1.5 percent of waste disposed in the short and medium-term planning periods.

## 4.5 PROGRAM IMPLEMENTATION

This section describes the implementation of the selected alternatives including designation of the persons or agencies responsible, the tasks to be undertaken, the time schedule, and funding required. The City Recycling Coordinator will take primary responsibility in developing, implementing, and monitoring selected alternatives.

### 4.5.1 Existing Programs

The primary goal of evaluating existing source reduction activities (thrift stores, diaper services, etc.) will be to establish methods to quantify materials diverted through source reduction activity and to investigate methods of promoting business activities as source reduction alternatives to

the community.

Table 4-2. Implementation Schedule for Existing Programs Evaluations

| Task | Responsible Entity | Start Date | Completion Date | Estimated Cost | Funding Source |
|---|---|---|---|---|---|
| Identify source reduction Activities | Recycling Coordinator | 1/93 | 2/93 | Staff Time 80 hours | City Funds |
| Quantify diversion activities | Recycling Coordinator/Business Owners | 2/93 | 11/93 ongoing, annually | Staff Time 40 hours | City Funds |
| Total Cost | --- | --- | --- | --- | --- |

### 4.5.2 Quantity-Based Variable Rates for Residential Waste Generators (Alternative 1)

This alternative is selected for medium-term implementation as a contingency measure, should the 50 percent diversion goal fall short.

**Table 4-3. Implementation Schedule for Quantity-Based Variable Rates for Residential Waste Generators**

| Task | Responsible Entity | Start Date | Completion Date | Estimated Cost | Funding Source |
|---|---|---|---|---|---|
| Determine total revenues required from garbage rate | Franchised Waste Hauler/Recycling Coordinator | 1/93 | 3/93 | $5,000 | Rate Structure |
| Perform rate and program feasibility study | Consultant/Franchised Waste Hauler/ Recycling Coordinator | 3/93 | 5/93 | $25,000 | Rate Structure |
| Develop new rate structure program | Consultant/Franchised Waste Hauler/ Recycling Coordinator | 9/95 | 12/95 | $20,000 | Rate Structure |
| Develop education program | Franchised Waste Hauler/ Recycling Coordinator | 11/95 | 12/95 | $1,500 | Rate Structure |
| Public hearing | City Council | 1/96 | 4/96 | N/A | N/A |
| Procure necessary equipment, materials | Franchised Waste Hauler | 4/96 | 7/96 | $250,000 | Rate Structure |
| Provide promotion & education | Franchised Waste Hauler/ Recycling Coordinator | 5/96 | 6/96 | $10,000 | Rate Structure |
| Begin full scale operations | Franchised Waste Hauler | 10/96 | ongoing | $5,000 | Rate Structure |
| Monitor and evaluate | Recycling Coordinator | 12/96 | ongoing, quarterly | $2,500 | Rate Structure |
| Total Cost | --- | --- | --- | $319,000 | --- |

### 4.5.3 Backyard Composting (Alternative 5)

This alternative will involve determining the scope of the program and the type of the technology to be used for an effective program. Since other backyard composting programs are underway in other communities, the City will utilize the knowledge derived from these programs to develop an educational program for City residents.

Table 4-4. Implementation Schedule for Backyard Composting

| Task | Responsible Entity | Start Date | Completion Date | Estimated Cost | Funding Source |
|---|---|---|---|---|---|
| Develop Program | Recycling Coordinator | 12/92 | 2/93 | Staff Time 40 - 80 hours | City Funds |
| Develop public information literature | Recycling Coordinator | 2/93 | 3/93 | $2,500 (Included in Public Education Costs) | Rate Structure |
| Provide public workshops Including Master Composter Program | Recycling Coordinator | 3/93 | 6/93, ongoing, bi-annually | Staff Time 80 hours | City Funds |
| Develop public demonstration project | Recycling Coordinator | 5/93 | ongoing | Staff Time 40 hours | City Funds |
| Develop and distribute press releases | Recycling Coordinator | 6/93 | ongoing, bi-annually | Staff Time 8 hours | City Funds |
| Monitor and evaluate | Recycling Coordinator | 6/93 | ongoing, bi-annually | $7,500 bi-annually. Staff Time 40 hours | City Funds |
| Total Cost | --- | --- | --- | 208 - 248 hours | --- |

### 4.5.4 Awards and Public Recognition Program (Alternative 7)

The Recycling Coordinator will work with the City and local organizations such as the Chamber of Commerce to develop Awards and Public Recognition programs. Program development will include choosing a suitable forum(s) to present the awards along with development of criteria for selecting who will be distinguished.

Table 4-5. Implementation Schedule for Awards and Public Recognition

| Task | Responsible Entity | Start Date | Completion Date | Estimated Cost | Funding Source |
|---|---|---|---|---|---|
| Develop Formal Recognition Program | Recycling Coordinator | 6/93 | 10/93 | Staff Time 40 hours/20 hours annually | City Funds |
| Select Recipient | Recycling Coordinator | 10/93 | Ongoing, annually | Staff Time 8 hours | City Funds |
| Award Plaque, Trophy, etc. | Recycling Coordinator | 12/93 | Ongoing, annually | Staff Time 8 hours | City Funds |
| Monitor & Evaluate Program | Recycling Coordinator | 12/93 | Ongoing, annually | Staff Time 10 hours | City Funds |
| Total Cost | --- | --- | --- | 66 hours | --- |

### 4.5.5 Nonprocurement Source Reduction Programs (Alternative 8)

Implementation involves determining what source reduction activities will be effective and then educating City government employees about these options.

Table 4-6. Implementation Schedule for Nonprocurement Source Reduction

| Task | Responsible Entity | Start Date | Completion Date | Estimated Cost | Funding Source |
|---|---|---|---|---|---|
| Develop Program | Recycling Coordinator/City Departmental Managers | 3/93 | 6/93 | Staff Time 40 to 80 hours | City Funds |
| Implement Program at City Hall | Recycling Coordinator/City Departmental Managers | 7/93 | 9/93 | Staff Time 40 hours | City Funds |
| Promote Program as a Model for Business Community | Recycling Coordinator | 1/94 | ongoing | Staff Time 40 hours | City Funds |
| Monitor and Evaluate Program Effectiveness | Recycling Coordinator | 12/93 | ongoing, annually | Staff Time 10 hours | City Funds |
| Total Cost | --- | --- | --- | 130 - 170 hours | --- |

### 4.5.6 Adoption of Government Procurement Policies (Alternative 9)

This program involves the design of an effective, implementable program. It is entirely dependent upon the City government to develop and adopt it.

Table 4-7. Implementation Schedule for Government Procurement Policies

| Task | Responsible Entity | Start Date | Completion Date | Estimated Cost | Funding Source |
|---|---|---|---|---|---|
| Identify Substitute Products and Areas of Waste | Recycling Coordinator | 3/93 | ongoing | Staff Time 40 - 80 hours | City Funds |
| Create New Purchasing Guidelines | Recycling Coordinator/ City Council | 6/93 | 9/93 | Staff Time 40 hours | City Funds |
| Implement Program | Recycling Coordinator | 9/93 | ongoing | Staff Time 80 hours | City Funds |
| Monitor & Evaluate Program Effectiveness | Recycling Coordinator | 12/93 | ongoing, annually | Staff Time 20 to 40 hours | City Funds |
| Total Cost | --- | --- | --- | 220 - 240 hours | --- |

## 4.6 MONITORING AND EVALUATION

This section summarizes how selected programs will be monitored and evaluated. Monitoring and evaluation is necessary to measure the success of selected programs and to provide a measure by which adjustments can be made to increase program effectiveness if diversion goals will not be met.

In general, reporting for most programs will be compiled by City Staff and the Recycling Coordinator on a quarterly basis.

Existing Programs

Objective

The objective of this alternative will be to devise a reporting methodology to determine and track existing source reduction activities in the City (including thrift shops, diaper services and any other activities discovered during the course of the survey).

Criteria/Methods for Evaluation

The method for quantifying results of source reduction activity through existing activities will result from the reporting methods (including surveys and telephone interviews) the Recycling Coordinator will undertake.

Responsible Entity

This data will be summarized annually by the Recycling Coordinator.

Contingency Plan if Shortfall

At this time, no diversion goals have been set for existing programs. Shortfalls include a lack of response to the surveys. Should this occur, the Recycling Coordinator will re-contact the business to answer any questions and to verbally undertake the survey when practical.

Alternative 5: Backyard Composting

Objective

To achieve a participation level of 10 percent of the detached single-family residents in the City in the short-term and up to 25 percent by the medium-term.

Criteria/Method for Evaluation

The Recycling Coordinator shall maintain written records describing the total number of residents attending backyard composting workshops. As part of an bi-annual recycling/source reduction survey to conducted by the Recycling Coordinator, the level of participation and volume of materials being composted shall be estimated. The findings of the survey shall be compared to the objectives stated above.

Responsible Entities

Implementation of the workshops shall be shared by both the City and presenting organizations. Documenting the number of participants and quantities of materials being composted shall be completed by the Recycling Coordinator in conjunction with City Staff.

Contingency Plan if Shortfall

In the event of a shortfall, the following actions shall be considered:

- Increase costs of curbside collection of yard waste.
- Increase costs of garbage service.
- Increased public information and education efforts targeted at backyard composting.

Alternative 6: Education Efforts

Objectives

To create an overall awareness of source reduction programs being practiced by the City by 60 percent of its residents by 1995 and 90 percent of the population by the year 2000.

Criteria/Method of Evaluation

The criteria is the achievement of a level of awareness among the City's residents as described above. This shall be evaluated through a yearly survey conducted by the Recycling Coordinator and City Staff asking questions on recycling, source reduction and composting practices currently being done.

Responsible Entity

The Recycling Coordinator shall be the responsible for evaluating education efforts directed at source reduction. This shall be done in conjunction with the Public Information and Education Component of this element. Please refer to this component for further details.

Contingency Plan if Shortfall

Please refer to the Public Information and Education Component of this element.

Alternative 7: Awards and Public Recognition

Objective

To encourage recycling, composting and source reduction activities through an awards and public recognition program. This program will be promoted to the maximum extent possible through the local media.

Criteria/Method for Evaluation

The Recycling Coordinator will seek proper venues and criteria to present awards to those in the City who provide exemplary waste diversion programs. This program is designed to increase overall effectiveness of waste reduction programs.

Responsible Entities

Recycling Coordinator.

Contingency Plan if Shortfall

No shortfalls in waste diversion are expected through this program.

Alternative 8: Non-Procurement Source Reduction Programs by the City Government

Objective

The City will adopt and implement non-procurement programs within its offices and facilities and achieve a level of understanding and participation among 80 percent of its employees by 1995.

Criteria/Methods for Evaluation

The effectiveness of this program is difficult to quantify. Practices and methods of doing business will be documented through administrative directives or policies issued by the City Council and/or various department managers. The level of understanding and participation among employees can be seen through the production of work and change in office practices. However, it is doubtful that a measurable change in diversion that can be accredited to this alternative alone.

Responsible Entity

City government.

Contingency Plan if Shortfall

Continue to remind employees of the non-procurement policies implemented by the City and its' facilities. This will be done through employee meetings and written memos.

Alternative 9: Adoption of Local Government Procurement Policies

Objective

To adopt procurement policies resulting in a 20 percent increase in the purchase of recyclable materials, reusable goods and more durable goods by 1995.

Criteria/Methods of Evaluation

Evaluation of program effectiveness will be based on the following criteria:

- Annual accounting of purchases and awards for contract services which include specifications for supplies and materials meeting recycled content standards.
- Analysis of fiscal impacts of program.
- Estimates of the quantity of waste reduction.

Responsible Entity

City Government.

Contingency Plan if Shortfall

Review adopted policies and determine if they are being followed. If they are not being followed, determine if it is because they are not feasible or due to a lack of understanding on the employees part. Revise policies to address shortfall and findings after reviewing the past year's procurement activities.

### 4.6.1 Funding

Monitoring costs primarily include staff hours on the part of the Recycling Coordinator and City Staff. Estimated staff hours for monitoring are included in program costs summarized in Section 4.5. The funding source will be City Funds.

1. Carl Lehrburger, Jocelyn Mullen, and C. V. Jones, 1991, Diapers: Environmental Impacts and Lifecycle Analyses, report to The National Association of Diaper Services, 45 pp.

# SECTION 5

# RECYCLING COMPONENT

Recycling is the process of collecting, sorting, cleansing, treating, and reconstituting materials that would otherwise become solid waste; and then returning them to the economic mainstream in the form of raw material for new products that meet the quality standards established by the marketplace.

The purpose of the Recycling Component is to identify, evaluate, select, and establish an implementation plan for residential, industrial, and institutional recycling programs that will contribute towards meeting and exceeding the required short- and medium-term diversion goals of 25 percent and 50 percent respectively.

The source of statistical information in this component is derived from the Waste Generation Study which describes the waste characterization for the City of Woodland. The tonnages are expected to grow proportionately with community size.

## 5.1 " GOALS AND OBJECTIVES

This section identifies the City's objectives for the short- and medium-term planning periods. The objectives will identify waste diversion goals based on the results of the Waste Generation Study and the recycling alternatives selected by the City.

### 5.1.1 Program Goals and Objectives

The City has recently implemented a curbside recycling program servicing all single family dwellings (SFD) and several multi-family dwellings (MFD) in the City. A survey of several businesses in the City also indicates that several companies have very successful commercial recycling programs. Diversion programs which have been selected by the City are designed to facilitate these programs and increase the levels of recycling taking place. Objectives to be accomplished in the short- and medium-term planning periods are the following:

- Expand current commercial/industrial recycling through City efforts and the franchised waste hauler in the short and medium-term planning periods;

- Increase levels of commercial and industrial waste diversion through the rerouting of collection vehicles in the medium-term planning period to reduce material contamination and increase material recovery rates at the mixed waste MRF proposed for the Yolo County Central Landfill;

- Participate in regional County integrated waste management programs to take advantage of economies of scale and provide consistent waste management

programs throughout the region. Specifically, participate in the County's mixed waste processing program through the diversion of commercial and industrial wastes to the regional materials recovery facility proposed for the County in the medium-term planning period; and

- Divert through recycling approximately 6,693 tons per year (TPY), 6.6 percent of total waste generated in the short-term and 27,908 TPY, 23.1 percent, in the medium-term planning period.

### 5.1.2 Market Development Goals and Objectives

In addition to the above goals and objectives, the following market development alternatives have been identified as ongoing measures to assure that markets are available for materials recovered by waste diversion programs.

- Establish Recycling Market Development Zones within the City.
- Identify materials where market demand is exceptionally weak and develop procurement policies, legislation, or economic development efforts to diversify markets for such materials.
- Identify alternative uses for materials with weak market potential. Material types to be considered will include all grades of waste paper, yard waste, and plastics.
- Identify industries which utilize high volumes of postconsumer or secondary materials, prioritize the list of industries, and prepare a work plan targeting those companies for post-consumer materials market development.
- Determine the feasibility of regional buying pools with other local governments and industry for recycled materials or products.
- Develop an implementation plan for establishing recycling plants and businesses which utilize secondary materials as feedstock (i.e., mixed plastics recycling, paper mills).
- Identify and implement incentives to promote consumer purchasing of products with recycled material content.

### 5.1.3 Targeted Materials

The Solid Waste Generation Study (SWGS) identified materials disposed of in the Yolo County Central Landfill (YCCL) by the City of Woodland. Based upon the results of the SWGS of markets for recovered materials, target materials available for diversion through recycling have

been defined as:

- Paper products (newsprint, corrugated cardboard, kraft paper, high-grade and mixed paper) - 18.7 percent by weight of the total waste disposed;
- Plastics (HDPE & PET) - 0.9 percent by weight of the waste disposed;
- Plastics (HDPE, PET, films, and polystyrene) - 3.5 percent by weight of the waste disposed;
- Metals (aluminum, tin cans, and other metals) - 5.3 percent of the total waste disposed by weight; and
- Glass (CA Redemption and other recyclable) - 2.8 percent by weight of the waste disposed.

## 5.2 EXISTING CONDITIONS

The following waste diversion programs have been identified in the City,

### Curbside Collection

A curbside collection program has recently been expanded to all single family and several multi-family households in the City. Materials collected include newspapers, recyclable glass containers, PET, HDPE, and aluminum and bi-metal cans. This service is offered on a weekly basis on the day of normal refuse collection.

### Private Sector Recycling

Private sector commercial and industrial recycling has also been identified in the City through a recycling survey conducted in conjunction with the SWGS.

### Commercial/Industrial Recycling

Commercial and industrial recycling is also provided by Waste Management of Woodland. These private sector programs target corrugated cardboard and metals diverting approximately 600 TPY and 100 TPY respectively.

### Non-Profit Recycling

Bi-monthly collection of newspaper is conducted by Masonic Youth and the Holey Rosary non-profit organizations.

In addition to the above on-going programs, an anti-scavaging ordinance has recently been developed and adopted by the City to facilitate curbside recycling. Elements of the ordinance include the following:

- Establishes the ownership of the recyclable materials and recycling containers;
- Lists prohibited acts which includes not only taking of materials but also littering, destruction of materials, and material contamination;
- Identifies civil actions against violators; and
- Allows for non-profit groups to raise money by collecting and selling recyclable materials on a case by case basis.

### 5.2.1 Anticipated Decrease of Recycling Activities

The existing bi-monthly newspaper collection program will continue, although the volume of material collected may decrease. This decrease is expected due to the recent implementation of the City's curbside collection program. Masonic Youth, which collects newspaper door-to-door, may not see a drop in the quantity of material recovered; however, Holy Rosary, which collects newspaper through drop-off operations, may see a reduction in the quantity of material recovered.

## 5.3 EVALUATION OF ALTERNATIVES

Five recycling program alternatives have been considered for recovering recyclable materials from the waste stream. These include:

| | |
|---|---|
| Alternative 1. | Residential Curbside Collection Program Expansion (selected as a contingency alternative) |
| Alternative 2. | Commercial/Industrial Collection Program Expansion (selected) |
| Alternative 3. | Drop-Off Recycling |
| Alternative 4. | Mandatory Recycling Law |
| Alternative 5. | Automated Materials Recovery Facility (selected) |

Using the evaluations listed on the following pages, the City will select the programs that will be most effective and appropriate to its needs.

Alternative 1. Residential Curbside Collection Program Expansion

A residential curbside recycling program has recently been established in the City and is currently offered to all single family dwellings (SFD) and several multi-family dwellings (MFD)

(up to four units in size) on a voluntary basis. Residents are provided with stacking recycling containers for the collection of newspaper, glass, tin and aluminum cans, and PET and HDPE plastics. The recyclable materials are collected on the same day as normal refuse collection and delivered to a processing facility located within Woodland where materials are separated and/or baled for market.

Expansion of current curbside collections could be accomplished through the following options:

Option 1 - Offer current curbside collection services to all MFD's in the City;

Option 2 - Target additional waste types for diversion through the existing program; and

Option 3 - Target additional waste types for diversion and provide recycling services to all residential units in the City.

Additional waste types to be targeted for diversion would include cardboard, high-grade paper, and mixed waste paper, all plastics, and all metals. Curbside collection services currently offered to MFD complexes of 2 to 4 units could also be expanded to include MFD complexes of 5 or more units - an additional 3,800 units.

Program expansion considerations for offering collection services to all MFD's would include type and size of recycling containers, the availability of space for containers, day of collection, and program promotion and publicity. Containers suitable for MFD collections would likely be 90 to 110 gallon toters for separate containerization of newspaper/paper and other mixed recycables.

Effectiveness

Diversion data is not available for the recently implemented curbside collection program; however, based on the SWGS, it is estimated that the maximum diversion rate possible targeting the current waste types is approximately 1.8 percent of all waste generated.

Option 1--

Expansion of the current collection program to all MFD units, targeting the current waste types, would increase the current estimated diversion rate by 0.5 percent for a total diversion rate of 2.3 percent.

Option 2--

Expansion of the program to target additional waste types for diversion through the existing the curbside collection program would result in an increase in diversion levels by approximately 1.5 percent for a total diversion rate of 3.3 percent.

Option 3--

Expansion of the curbside collection program to all residential units targeting additional waste types would result in an increase in the current diversion rate by approximately 2.3 percent for a total diversion rate of 4.1 percent.

Hazards

A curbside collection program poses no significant environmental, health, or safety hazards; however, collection may create a slight increase in traffic, noise, and litter.

Ability to Accommodate Change

A curbside collection program can easily adapt to changing economic and technological conditions. As the value of recyclable materials changes, new material may be added to the program.

Consequences on Waste Stream Composition

A completely expanded curbside collection program will result in a reduction of approximately 4.1 percent of waste generated reducing the quantity of newsprint, plastic, aluminum cans, tin food and beverage cans, corrugated cardboard, mixed paper, and glass entering the waste stream and being landfilled.

Ability to be Implemented

Expansion of the current program to include other materials and all MFD units for curbside collection can be implemented in the short-term planning period.

Need for Facilities

Facilities are currently available to sort and process materials collected through curbside collection.

Consistency with Local Policies, Plans, and Ordinances

Expansion of the curbside collection program does not conflict with any local policies, plans, or ordinances.

Institutional Barriers to Implementation

Institutional barriers which may effect the expansion of the curbside collection program would include:

- Space limitations for locating MFD collection containers;
- Cooperation of MFD building managers and tenants;

Costs

Costs for the current curbside collections is covered by a $0.97 surcharge on monthly residential refuse service.

Option 1--

Capital costs for expansion of the current program to all MFD units is estimated to be approximately $66,400. This estimate assumes that the remaining 3,800 MFD units which currently do not receive recycling services consist of buildings with an average size of 12 units each. It is also assume that each facility would require 3 "Toter" type containers. The net cost per household per month for collection and processing of materials is estimated to be $0.05 per household. This estimate is based on a "net" collection and processing cost (including material revenues) of approximately $50.00 per ton.

Option 2--

Targeting additional waste types for diversion through the current program would likely require additional recycling containers for each household. Assuming a participation rate of approximately 90 percent and that one additional container per household would be necessary, capital costs for this program expansion would be approximately $66,000. Costs for collection and processing of the additional materials is estimated to be approximately $0.14 per household per month. This estimate is based on a "net" collection and processing cost of approximately $50.00 per ton.

Option 3--

Full expansion of the current program to include additional waste types and all MFD units in the City would require approximately $132,400 in capital costs and an increased collection and processing cost of approximately $0.22 per household per month. This estimate is based on a "net" collection and processing cost of approximately $50.00 per ton.

Market Availability

The materials to be collected by the expanded curbside collection program include paper, mixed paper, cardboard, PET, HDPE, other plastics, aluminum cans, tin food and beverage cans, ferrous and mon-ferrous metals, and glass. A summary of available markets in the region is located in Appendix A.

Materials with limited markets such as pigmented HDPE, plastic film, and other plastics will be facilitated through market development goals and objectives outlined in Section 5.1.2.

Public vs. Private Operation

The franchised waste hauler has the exclusive right to collect and dispose of solid waste and recyclable materials. A publicly operated program would be in conflict with the current

franchise agreement.

Alternative 3. Commercial and Industrial Collection Program Expansion

Through the City's franchised waste hauler, commercial and industrial recycling is currently provided to several businesses within the City of Woodland. These private sector programs target corrugated cardboard and metals diverting approximately 600 and 100 TPY respectively. Private sector commercial and industrial recycling has also been identified in the City through a recycling survey conducted in conjunction with the SWGS.

Through this alternative, the City's recycling coordinator would facilitate commercial/industrial waste diversion through program promotion and in-person contact with prospective Woodland businesses. The recycling coordinator, in conjunction with the franchised waste hauler, would facilitate the development of company in-house programs; however, program development would ultimately be the responsibility of the hauler. Commercial/industrial recycling programs would likely target materials with readily available markets. Material types to be targeted would include restaurant and bar glass, cardboard, and high-grade paper.

Effectiveness

Targeting cardboard, high-grade paper, and glass through commercial recycling would result in a diversion rate of approximately 4.7 percent of waste generated for the short-term planning period and 5.9 percent for the medium-term planning period. Table 5-1 summarizes waste diversion estimates for expanded commercial recycling.

Table 5-1. Estimates of Waste Diversion Through Expanded Commercial Recycling

| Waste Type | 1990 Tonnage Available (TPY) | Recovery Rate (percent) | Waste Diversion (TPY) | Waste Diversion (percent) |
|---|---|---|---|---|
| Cardboard | 5,423 | 75 | 4,067 | 4.8 |
| High-grade paper | 1,364 | 60 | 818 | 1.0 |
| Glass | 333 | 60 | 200 | 0.2 |
| Total | 7,120 | - | 5,085 | 6.0 |

Hazards

An increase in commercial collection activity will not pose any significant environmental, health, or safety hazards. However, the program could create minimal additional traffic and noise problems. Individual businesses or industries may encounter hazards in locating containers of recyclables for pickup.

Costs
The costs for this program will be paid through the commercial garbage rates which are regulated by the City of Woodland. City staffing requirements for this program are estimated to be 780 hours annually.

Ability to Accommodate Change
This alternative is very flexible as the program operator is able to target waste types on a case by case basis depending on the quantity of material and available markets.

Consequences on Waste Stream Composition
An expanded commercial recycling program would remove significant percentages of paper products, aluminum, glass, wood, and ferrous and nonferrous metals from the waste stream; however, for purpose of this evaluation, materials to be targeted are limited to cardboard, high-grade paper, and glass.

Ability to be Implemented
This alternative can be implemented in the short-term planning period.

Need for Facilities
Materials collected through this alternative would require additional material processing at an intermediate processing center (IPC). Intermediate processing centers are distribution centers that receive, separate, process, and market recyclable materials. They can be operated in conjunction with drop-offs, curbside collection programs, industrial/commercial recycling ventures, and buy-back centers processing either separated or commingled recyclables.

An intermediate processing center is currently on-line within the City for the processing of commingled materials collected at curbside. This facility is owned and operated by Waste Management of Woodland for the sorting and processing of glass, metals, and plastics. An additional IPC is scheduled to come on-line in 1992 which will process paper collected through the City's curbside and commercial programs. This facility would also be available to process materials collected through expanded commercial recycling.

Consistency with Local Policies, Plans, and Ordinances
Implementation of this alternative is consistent with local policies, plans and ordinances.

Institutional Barriers to Implementation
There are no institutional barriers that would prevent the expansion of the existing commercial recycling program.

Market Availability
Markets are available for materials identified to be targeted and are summarized in Appendix A.

Public vs. Private Operation

Commercial/industrial recycling services are currently provided by the franchised waste hauler.

Public operation of this alternative would require increased staffing of City personnel and capital expenditures for the purchase of collection vehicles, and waste handling and processing equipment.

For the City to assist on-going recycling through the current franchised waste hauler significant diversion levels can be obtained at minimal expense to the jurisdiction.

## Alternative 4. Drop-off Recycling

Drop-off centers vary from unattended containers to fully equipped and staffed facilities that receive, process, and store recyclable materials and may be linked to a central facility for processing, bulk storage, and marketing. Drop-off centers are capable of handling all recyclable goods and can be located in any space convenient for delivering materials.

Drop-off centers rely on individuals to haul their own recyclables to the facility and contribute materials without payment. Generally, the centers require a low investment in capital and operating costs. The drawbacks to drop-off centers are potential contamination of recyclables, vandalism, theft at unattended sites, and the relatively low participation rates and diversion resulting from dependence on customer self-hauling.

Unattended containers can be located at schools, shopping centers, post offices, gas stations, or any other convenient location. Collection of materials from these facilities is usually accomplished through front loaders or specially designed vehicles. The centers can be equipped to collect newsprint, plastic, aluminum cans, tin cans, glass, and corrugated cardboard.

Effectiveness

A drop-off center would likely service the residential, commercial, and industrial waste sectors; therefore, diversion estimates are based on the total quantity of waste currently generated by waste type from these sources. Actual data with respect to waste diversion through drop-off programs is limited; therefore, a 10 percent diversion rate for each waste type is assumed for evaluation purposes. The rate of diversion anticipated to be achieved through this alternative is approximately 1.7 percent. Table 5-2 summarizes waste diversion through this alternative.

Table 5-2. Projected Amounts of Waste Diverted by Drop-off Centers

| Waste Type | 1990 Tonnage Available (TPY) | Recovery Rate (percent) | Total Recovery (TPY) |
|---|---|---|---|
| Newspaper | 1,366 | 10 | 137 |
| Cardboard | 6,034 | 10 | 603 |
| Ledger paper | 1,529 | 10 | 153 |
| Aluminum cans | 139 | 10 | 14 |
| Tin cans | 613 | 10 | 61 |
| Glass | 1,410 | 10 | 141 |
| Ferrous | 1,889 | 10 | 189 |
| Nonferrous | 948 | 10 | 95 |
| PET plastic | 68 | 10 | 7 |
| Total | 13,996 | --- | 1,400 |

Hazards

Environmental impacts would include localized traffic and noise.

The traffic volumes would produce air emissions during trips to and from the facilities. Facility operations would not be expected to generate air emissions.

Noise would be generated from vehicle traffic and materials handling. The extent of the potential impact would depend on the actual increase in vehicle traffic, the current traffic, ambient noise levels, and the number of transfer vehicles servicing the center.

Ability to Accommodate Change

A drop-off center can easily adapt to changing economic and technological conditions. As the value of recyclable materials change, the choice of materials targeted for recovery can be varied.

Consequences on Waste Stream Composition

Drop-off centers will result in an increase in the quantity of paper, plastic, metals, and glass diverted from the waste stream.

Ability to be Implemented

Implementation could be accomplished within 6 months to 3 years depending upon siting, design,

necessity of CEQA documentation, and local permitting procedures.

Need for Facilities

A facility would be necessary as described in the alternative description. Facility requirements could simply involve the siting of collection containers at appropriate locations in the City. Locations could include schools, shopping centers, gas stations, or other convenient locations. Recyclables collected from drop-off sites would likely be transported to existing processing facilities.

Consistency with Local Policies, Plans, and Ordinances

A drop-off recycling program does not conflict with local policies, plans, or ordinances. In cases where roll-off containers in specially designated pickup areas are involved, zoning issues may have to be addressed.

Institutional Barriers to Implementation

Local policies currently allow smaller buy-back (redemption) centers to be located in commercial and industrial areas. Depending on the size of the facility siting options could be limited to commercial or industrially zoned areas.

Costs

Development of a drop-off center requires locating a site as well as purchasing equipment, hiring personnel, and educating the public to encourage participation. Capital costs could range between $1,500 to $25,000 per site. Operating and maintenance costs will depend on the size and the design of the operation.

Market Availability

Materials would be targeted based on market availability. Markets are currently available for materials expected to be targeted through this program. A summary of markets is located in Appendix A.

Public vs. Private Operation

Drop-off centers can be operated by either the public or private sector. City operated centers would be in direct competition with the private sector for revenue-producing materials. Private operation by businesses or nonprofit groups would be the preferred option.

## Alternative 5. Mandatory Recycling Laws

Through this alternative the City could issue an ordinance which would ban from disposal waste types which are targeted through residential curbside and commercial recycling programs. An ordinance of this nature would essentially serve to increase participation rates and recovery rates of targeted materials. For this alternative to be effective, the City would need to assure that all residents and commercial businesses are provided with alternatives to disposing materials which

are banned from the waste stream.

Effectiveness
The effectiveness of this option may largely depend on the degree of enforcement and the level of promotion by the City. Assuming aggressive enforcement and promotion efforts, such an ordinance may substantially increase participation in curbside and commercial programs. Without enforcement this alternative could serve as a strong statement from City government regarding the City's commitment to recycling.

Hazards
Illegal dumping may result if economical diversion options are not available to residential and commercial/industrial waste generators.

Ability to Accommodate Change
This option is very flexible as it affords the City the ability to add to its list of prohibited items.

Consequences on Waste Stream Composition
Increased recycling as a response to mandatory recycling laws will help the City realize its AB 939 goals.

Ability to be Implemented
This alternative can be implemented in the short-term planning period. Should the city choose to enforce the ordinance, enforcement mechanisms will be necessary which could require additional City staffing.

Need For Facilities
No facilities are required.

Consistency with Local Policies, Plans and Ordinances
This alternative is not consistent with the City's plans to provide recycling services to residential and commercial/industrial waste generators on a volunteer basis. This alternative may increase levels of waste diversion; however, the alternative is not seen as an advantage due to the level of enforcement which may be necessary and possible negative perceptions by the private sector.

Institutional Barriers to Implementation
No institutional barriers are known to exist which would pose a barrier to implementation.

Market Availability
Markets are not required for this alternative.

Public v Private Operation
Development and implementation of this alternative would be the responsibility of the City of Woodland.

Costs

The cost for the development of an ordinance is estimated to be approximately $10,000. Enforcement of the ordinance would require additional staffing, coordination of various city departments, and development of enforcement mechanisms. Enforcement costs are estimated to be a minimum of $50,000 annually.

Alternative 7. Automated Materials Recovery Facility

Automated MRFs are centralized distribution points that receive, separate, process, and market recyclable materials directly from the general waste stream. They are capable of processing mixed municipal waste without prior sorting and remove targeted recyclable items. In addition, they may be operated in conjunction with both drop-off and curbside collection programs, processing either separated or commingled recyclables. The primary advantage of a mixed waste MRF is the ability to combine and uniformly process a large percentage of materials from a municipality or a region, meeting quantity and quality requirements imposed by material buyers.

An automated MRF can receive the waste stream as it is disposed without the need for prior separation. This ability removes the burden of source separation from the waste generator and the need for any separate collection system for source-separated materials such as curbside programs.

Mixed waste processing involves a combination of manual and mechanical sorting and processing operations. Waste processing begins when the load arrives on the tipping floor where the load is inspected for any potentially hazardous materials. Non-compacted loads from self-haul and roll-off sources can be off-loaded on the tipping floor for separation of wood, dirt, asphalt, cement, yard debris and recyclables by hand and with heavy equipment.

General compacted refuse is deposited onto a tipping floor and ultimately to a conveyor system for both mechanized and manual separation of recyclable materials. Mechanized separation might consist of passing the load over a shaker screen to sort out fine materials, a magnetic separator to remove ferrous items, or air classification for targeted light materials. Manual separation involves sorters removing targeted items as they pass over the conveyor and placing these items into separate bins for further processing.

Materials are generally processed in the following ways:

- Paper, which often will arrive commingled, is pulled off the production line at various points depending on the types of paper accepted, the system used, and the baler. This material is then baled for shipment to a broker/processor.

- Steel cans are pulled from the system using a magnet and shredded or baled depending on the market.

- Light aluminum and plastic is separated from glass using either air classification or inclined sorting equipment.

- Glass is manually separated by color, then crushed and stored for the market.

Any residual materials at the end of the conveyor may be diverted to composting programs, Refuse Derived Fuel (RDF), the transfer station, or the landfill for disposal.

Effectiveness

In general, mixed waste MRFs have a diversion potential of 30 percent to 40 percent of the total waste stream. Once a given material has been targeted, a 60 to 80 percent diversion rate for that material can be realized. The effectiveness of an automated MRF is at its highest when recyclable-rich loads are processed. The most effective use of a MRF is as a sorting facility for selected commercial waste loads when residential wastes have been recycled through source separated collection programs. Table 5-3 summarizes the levels of diversion that can be achieved through this alternative.

Table 5-3. Estimate of Waste Diversion Through Mixed Waste Processing

| Waste Type | 1990 Tonnage Available (TPY) | Recovery Rate (TPY) | Waste Diversion (TPY) | Waste Diversion (percent) |
|---|---|---|---|---|
| Newsprint | 494 | 80 | 395 | 0.47 |
| Cardboard | 5,423 | 80 | 4,338 | 5.13 |
| High-grade | 1,364 | 80 | 1,091 | 1.29 |
| Mixed paper | 2,138 | 80 | 1,710 | 2.02 |
| Cont. paper | 2,790 | 60 | 1,674 | 1.98 |
| PET | 11 | 80 | 9 | 0.01 |
| HDPE | 80 | 80 | 64 | 0.08 |
| Pig. HDPE | 303 | 80 | 242 | 0.29 |
| Film | 1,131 | 60 | 679 | 0.80 |
| Other Plastic | 2,365 | 60 | 1,419 | 1.68 |
| CA Redemption | 272 | 80 | 218 | 0.26 |
| Recyclable glass | 61 | 80 | 49 | 0.06 |
| Aluminum | 103 | 80 | 82 | 0.10 |
| Ferrous | 1,717 | 80 | 1,374 | 1.62 |
| Bi-metal | 165 | 80 | 132.00 | 0.16 |
| Non-ferrous | 874 | 80 | 699 | 0.83 |
| Wood | 3,924 | 80 | 3,139 | 3.71 |
| Wood (treated) | 1,514 | 80 | 1,211 | 1.43 |
| Total | | - | 18,525 | 21.92 |

Hazards

As in all working situations where large machinery and equipment are used, health and safety policies at a MRF should be developed and followed by all employees.

Possible hazards associated with a facility are noise, litter, odor, and traffic. Facility design should mitigate many of these problems.

Ability to Accommodate Change

Changes in the waste stream may require alteration of the operation to accommodate different materials. In a mixed waste MRF, these changes may require alteration of the existing

equipment; however, in most cases, the system can be adjusted to address changes in the composition of the waste stream.

Consequences on Waste Stream Composition

A mixed waste MRF will target materials generated from the commercial/industrial waste stream, increasing the percentage of nonrecyclable materials to be landfilled. This diversion may have positive affects on the life of the landfill due to the diversion of high volume materials such as corrugated cardboard and plastics.

Ability to be Implemented

Implementation of a mixed waste MRF can be accomplished in 30 to 36 months. An in-line material recovery system is scheduled for implementation by the County during the medium-term planning period. A feasibility study will be initiated as part of the CoIWMP process as a first step towards implementation.

Need for Facilities

A mixed waste MRF would require site and facility development. Specific capacity requirements of the facility have not been determined at this time. The facility would be located at the YCCL processing commercial/industrial wastes generated from the Cities of Woodland, West Sacramento, and Winters.

Consistency with Local Policies, Plans, and Ordinances

Development of a mixed waste MRF does not conflict with local policies, plans, or ordinances.

Institutional Barriers to Implementation

There are no institutional barriers to implementation of this alternative.

Costs

Based on the County SRRE for unincorporated Yolo County, capital cost for the facility is estimated to range between $10 and $15 million. Operations and maintenance costs could range between $20 to $40 per ton depending on the degree on manual versus mechanical processing. Costs incurred in the planning, development and operation of the facility will be funded through recovered material revenues and the County Sanitation Enterprise Fund.

Market Availability

Markets are currently available for the materials to be recovered. A summary of markets is presented in Appendix A.

Public vs. Private Operation

The facility would likely be integrated into existing landfill operations. The facility could be operated by the County or through an operations contract with a private contractor.

## 5.4. SELECTION OF PROGRAMS

Summarized below are the alternative programs selected for implementation by the City of Woodland. The selections are based on meetings and conversations with City personnel during the development of the draft SRRE.

Alternative 1. Residential Curbside Collection Program Expansion

Through this alternative the City would offer collection services to all MFD's in the City and target additional waste types for diversion such as mixed paper (including cardboard), other plastics, and metals. Due to the fact that MFD's are dispersed throughout the City and that a significant percentage of buildings lack sufficient space to site additional collection containers, this program has been selected as a contingency measure if the City falls short of meeting waste diversion goals. The SRRE goals and objectives will be evaluated on an annual basis with respect to tonnage diverted and levels of participation and awareness achieved.

During the short-term planning period, the City will redefine building code requirements for MFD's to allow for addition storage space for locating refuse and recyclable material collection containers.

Alternative 2. Increased Commercial/Industrial Collection Programs

This alternative has been selected for implementation in the short-term planning period. The City's Recycling Coordinator and the franchise waste hauler will assume responsibility for implementation of the program.

Through this alternative, the City's recycling coordinator will facilitate commercial/industrial waste diversion through program promotion and in-person contact with prospective Woodland businesses. The recycling coordinator, in conjunction with the franchised waste hauler, will facilitate the development of company in-house programs; however, site specific program development will ultimately be the responsibility of the hauler. Commercial/industrial recycling programs will likely target materials with readily available markets. Material types to be targeted will include restaurant and bar glass, cardboard and high-grade paper. Other materials may be targeted on a site specific basis.

The hauler will also be directed in the short-term planning period to collect restaurant and other food waste refuse separately for disposal at YCCL. This will result in a reduction of material contamination in mixed waste loads and will facilitate waste recovery at the proposed MRF.

Alternative 5. Automated Material Recovery Facility

This alternative has been selected by the city for implementation in the medium-term planning period in a cooperative effort by Yolo County and the Cities of West Sacramento and Winters.

The proposed facility is to be sited at the YCCL. The Cities of Woodland, West Sacramento, and Winters have agreed to commit their non-source separated commercial/industrial waste streams to the facility. Specific waste types to be targeted will be determined based on available markets, market specifications, and material availability.

A feasibility study is scheduled to be undertaken in 1992 by the Yolo County Department of Public Works and Transportation to determine facility parameters, economics, and targeted waste streams for the proposed facility. At this time, policy issues will be developed to determine the County's role in facility ownership and operation, and waste flow controls. Construction of the facility is not expected to take place until 1996. The cost of development, construction, and operation of the facility will be funded through the County Sanitation Enterprise Fund.

## ALTERNATIVES NOT SELECTED

### Alternative 3. Drop-off Recycling

This program was not selected due to the limited quantity of materials which can be diverted through this alternative. A City operated drop-off program would also be in direct competition with non-profit organizations in the City. The City believes that this alternative is better suited for development and operation by private and non-profit community organizations.

### Alternative 4. Mandatory Recycling Laws

This alternative was not selected for implementation due to the non-consistency with the City's current policy of offering recycling services to residential and commercial/industrial waste sectors on a voluntary basis.

### 5.4.1 Cumulative Integrated Effect of the Programs

Estimates of waste diversion through the current curbside program and the programs selected above are estimated to be 6.6 percent and 23.1 percent for the short and medium-term planning periods respectively. Tables 4 and 5 present estimates of material diversion through the selected programs. These estimates are based on the quantity and composition of solid waste identified in the SWGS.

Table 5-4. Summary of Waste Diversion Through Selected Alternatives for the Sort-Term Planning Period

| Waste Type | 1995 Disposal Rate (TPY) | Amount Diverted Through Programs | | | Total Diverted |
|---|---|---|---|---|---|
| | | Estimated Curbside Diversion (TPY) | Commercial/ Industrial Expansion (TPY) | Mixed Waste MRF (TPY) | |
| Newspaper | 1,642 | 594.1 | — | — | 594.1 |
| Cardboard | 7,249 | — | 3,882.8 | — | 3,882.8 |
| High-grade paper | 1,836 | — | 651.2 | — | 651.2 |
| Mixed paper | 4,318 | — | — | — | 0.0 |
| Cont. paper | 5,127 | — | — | — | 0.0 |
| PET | 82 | 39.0 | — | — | 39.0 |
| HDPE | 176 | 57.2 | — | — | 57.2 |
| Pig. HDPE | 503 | — | — | — | 0.0 |
| Plastic film | 1,825 | — | — | — | 0.0 |
| Other plastic | 3,532 | — | — | — | 0.0 |
| CA glass | 767 | 308.1 | 194.8 | — | 502.9 |
| Recyclable glass | 903 | 533.3 | 43.9 | — | 577.2 |
| Aluminum | 166 | 24.1 | — | — | 24.1 |
| Bi-metal | 736 | 364.2 | — | — | 364.2 |
| Ferrous metals | 2,269 | — | — | — | 0.0 |
| Non-ferrous | 1,138 | — | — | — | 0.0 |
| Wood | 4,838 | — | — | — | 0.0 |
| Wood (treated) | 1,868 | — | — | — | 0.0 |
| Total Diversion | — | 1,920 | 4,773 | — | 6,693 |
| Percent Diversion | — | 1.89 | 4.70 | — | 6.59 |

| Waste Type | 2000 Disposal Rate (TPY) | Estimated Curbside Diversion (TPY) | Commercial/ Industrial Expansion (TPY) | MRF (TPY) | |
|---|---|---|---|---|---|
| Newspaper | 1,953 | 702.5 | — | 558.1 | 1,260.6 |
| Cardboard | 8,622 | — | 5,739.2 | 1,530.5 | 7,269.7 |
| High-grade paper | 2,183 | — | 1,155.1 | 616.1 | 1,771.2 |
| Mixed paper | 5,136 | — | — | 2,414.1 | 2,414.1 |
| Cont. paper | 6,099 | — | — | 2,362.8 | 2,362.8 |
| PET | 97 | 46.1 | — | 13.0 | 59.1 |
| HDPE | 209 | 67.7 | — | 56.2 | 123.9 |
| Pig. HDPE | 598 | — | — | 341.8 | 341.8 |
| Plastic film | 2,170 | — | — | 94.1 | 94.1 |
| Other plastic | 4,201 | — | — | 957.2 | 957.2 |
| CA glass | 912 | 364.2 | 230.4 | 122.9 | 717.5 |
| Recyclable glass | 1,074 | 630.6 | 51.9 | 27.7 | 710.2 |
| Aluminum | 198 | 28.4 | — | 116.8 | 145.2 |
| Bi-metal | 876 | 430.6 | — | 186.0 | 616.6 |
| Ferrous metals | 2,699 | — | — | 1,938.2 | 1,938.6 |
| Non-ferrous | 1,354 | — | — | 986.4 | 986.4 |
| Wood | 5,755 | — | — | 4,430.2 | 4,430.2 |
| Wood (treated) | 2,222 | — | — | 1,708.9 | 1,708.9 |
| Total Diversion | — | 2,270.1 | 7,176.6 | 18,461.0 | 27,907.7 |
| Percent Diversion | — | 1.88 | 5.94 | 15.28 | 23.1 |

### 5.4.2. End-Uses for Recycled Materials

A summary of end-uses for diverted materials is located in Table 5-6.

Table 5-6. End-Uses for Recycled Materials

| Materials | Markets | Uses |
|---|---|---|
| Kraft paper/corrugated cardboard | Brokers | Paper Products |
| Mixed Paper | Brokers | Paper products/building products |
| Newsprint | Brokers | Paper products/building products |
| High-grade paper | Brokers, Mills | Paper products/building products |
| Plastic film | Mills | Plastic products |
| HDPE Plastic | Mills | Plastic products |
| PET plastic | Mills | New PET bottles/plastic products |
| Polystyrene | Mills | Plastic products |
| Tin food and beverage cans | Mills | Steel products/precipitation mining agent |
| Other ferrous metals | Brokers | Metal products |
| Aluminum cans | Mills | New aluminum cans |
| Nonferrous metals | Brokers | Metal products |
| Redeemable glass | Mills | New glass containers |
| Other recyclable glass | Mills | New glass containers |
| Other glass | End Users | Road aggregate |
| Chipped wood | End Users | Boiler fuel |

### 5.4.3. End-Markets for Recyclable Materials Diverted from Selected Programs

A listing of end-markets for diverted materials is located in Appendix A.

## 5.5 PROGRAM IMPLEMENTATION

The following section describes the implementation of the selected recycling programs.

### 5.5.1 Implementation Tasks

The City Department of Public Works, the City Recycling Coordinator, the franchised waste hauler, and the County Department of Public Works and Transportation will take responsibility for implementation of the recycling alternatives selected. Implementation tasks, schedules, costs, and funding sources for implementation of the selected alternatives are summarized below in Tables 7 and 8.

Table 5-7. Implementation Schedule for Commercial Recycling Expansion

| Task | Responsible Entity | Start Date | Completion Date | Funding Source | Estimated Cost |
|---|---|---|---|---|---|
| Identify commercial and industrial accounts | City Staff/ Franchised Waste Hauler | 6/92 | Ongoing | City Funds/ Rate Structure | (1) (2) |
| Identify target materials | City Staff/ Franchised Waste Hauler | 6/92 | Ongoing | City Funds/ Rate Structure | (1) (2) |
| Identify markets | City Staff/ Franchise Waste Hauler | 6/92 | Ongoing | City Funds/ Rate Structure | (1) (2) |
| Provide technical assistance and information materials | City Staff/ Franchised Waste Hauler | 12/92 | Ongoing | City Funds/ Rate Structure | (1) (2) |
| Establish site specific recovery programs | Franchised Waste Hauler | 6/92 | Ongoing | Rate Structure | (2) |
| Monitor program effectiveness | City Staff/ Franchised Waste Hauler | 12/92 | Quarterly | City Funds/ Rate Structure | (1) (2) |
| Provide quarterly waste diversion reports | Franchised Waste Hauler | 12/92 | Ongoing | Refuse Rate | (2) |

(1) City Staffing requirements for this alternative is estimated to 780 hours annually.

(2) Services provided by the waste hauler for this alternative are incorporated into the existing franchise agreement.

Table 5-8. Yolo County Implementation Schedule for Mixed Waste MRF

| Task | Responsible Entity | Start Date | Completion Date | Funding Source | Estimated Cost |
|---|---|---|---|---|---|
| Identify participating jurisdictions | County Dept of Public Works and Transportation (DPWT) | 1/92 | Completed | CSEF* | Capital cost: $10 - $15 million |
| Through the CoIWMP process, integrate city and county SRRE's | DPWT | 3/92 | 12/92 | CSEF | |
| Conduct feasibility study to determine facility/system parameters, economics, and targeted waste streams | DPWT | 3/92 | 12/92 | CSEF | |
| Develop policy issues including county role in ownership/operation and flow control | DPWT | 4/92 | 1/93 | CSEF | |
| Define vendor procurement process for facility construction and operation as appropriate - select vendor | DPWT and/or private sector contractor | 1/93 | 7/93 | CSEF | |
| Obtain local and state reviews and permits necessary | DPWT and/or private sector contractor | 1/94 | 1/96 | CSEF | |
| Prepare plans and specifications for construction and operation of the facility | DPWT and/or private sector contractor | 1/95 | 1/96 | CSEF | |
| Construct facility, conduct start-up and performance testing | DPWT and/or private sector contractor | 1/96 | 6/97 | CSEF | |
| Begin operations of MRF | DPWT and/or private sector contractor | 6/97 | Ongoing | CSEF | |

* CSEF - County Sanitation Enterprise Fund.

## 5.6 MONITORING AND EVALUATION

This section identifies the methods that will be used by the City to monitor and evaluate the effectiveness of the selected programs relative to the stated diversion goals and objectives. Emphasis will be placed on the forecast diversion levels set forth in tables 5-4 and 5-5 of this component. Other consideration will be given to participation, quality of material received, and the quantity of waste diverted per household.

Methods to quantify program effectiveness will include:

- Gate monitoring a for changes in gross volumes and tonnage;
- Quantity of recyclable materials recovered - reported by waste type and program through the franchised waste hauler processing facilities;
- Quarterly waste generation studies will be conducted in 1992 and 1993 to establish a base line waste generated rate per household by waste type. These studies will be conducted utilizing the methodology established in SWGS - obtaining samples from individual households. Subsequent waste generation studies will be conducted on an as needed basis to determine the effectiveness of source reduction and recycling programs;
- Records of materials diverted through mixed waste processing at the County MRF; and
- Documentation of participation in residential and commercial recycling programs;

The franchised waste hauler will be responsible for the monitoring and evaluation of all authorized recycling programs within the City.

In addition the above monitoring activities, non-certified buy-backs and drop-off program operators will be required to report levels of waste diversion on a quarterly basis. Quantities of waste diverted through Certified Recycling Centers will be determined through communications with the California Department of Conservation. The quantity of waste diverted through private sector recycling efforts will continue to be documented through telephone and written surveys.

An annual review of the SRRE goals and objectives will be conducted to determine if the objectives of the element are being met. If it is found that the SRRE is not achieving the stated goals and objectives, amendments to the element will be considered to correct the shortfall.

## 5.6.1 Methods to Monitor and Quantify Program Results

### Alternative 2: Increased Commercial/Industrial Collection Programs

Objectives

To increase current commercial and industrial waste diversion to 4.7 percent in the short-term planning period and to 6.0 during the medium-term planning period.

To raise awareness levels in the commercial sector of recycling alternatives to 60 percent in the short-term planning period and to 90 percent during the medium-term planning period.

Responsible Entity

The City Recycling Coordinator and the franchised waste hauler shall be the responsible agency for implementation and monitoring of this program.

Criteria/Methods of Evaluation

To determine if the percent diversion is accomplished the hauler will maintain records of material diversion by waste type and quantity for materials collected through commercial accounts. Also, the hauler shall report the number of new private sector programs. These reports shall be provided to the City Recycling Coordinator for review and approval on a quarterly basis. In addition to the data recorded above, the waste hauler shall assist the City in an annual survey to determine the level of awareness of ongoing City recycling programs.

Contingency Plan if Shortfall

In the event that stated objectives are not achieved, the waste hauler and City staff shall review public information and education materials targeting the commercial sector and determine what improvements can be made. Existing rate structures may be evaluated to facilitate the levels of participation.

### Alternative 5: Mixed Waste MRF

Objective

To achieve a diversion level of 15.3 percent of solid waste entering the landfill during the medium term planning period.

Responsible Entity

The facility operator and/or the County Department of Public Works and Transportation shall be the responsible agencies for implementation and monitoring of this program.

Criteria/Methods of Evaluation

The weight of materials diverted will be compared against scale records of incoming loads.

Contingency Plan if Shortfall

In the event that stated objectives are not achieved the franchise waste hauler will revise collection routes to reduce the amount of material contamination.

### 5.6.2 Funding

Monitoring activity costs are included in current staffing requirements. Funding for waste hauler monitoring and evaluation activities is incorporated into the existing rate structure. Cost of the City Recycling Coordinator monitoring activities will funded through City funds.

# SECTION 6

## COMPOSTING COMPONENT

This component establishes the City's composting objectives, summarizes existing conditions, describes materials available to be composted, evaluates collection options and composting processes, and establishes a short- and medium-term program implementation schedule. In addition, this component estimates cost, and describes a method for monitoring and evaluating the effectiveness of the programs to be implemented.

### Background

Composting is a method of solid waste treatment by which organic solid wastes are biologically degraded under controlled aerobic or anaerobic conditions. The result is a stable, decomposed material which can be sold or distributed as a soil amendment that improves the moisture retention capacity of soil, adding nutrients and erosion control. At the same time that it produces a valuable resource, composting fulfills AB 939 goals by diverting a substantial volume of yard wastes and other organic materials from landfills.

Yard waste is the ideal material for composting because of its ease of separation and collection at the source. Wood waste can also be used, but it takes several years to decompose, making it more appropriate as a bulking agent in the composting of sewage sludge. Wood can be chipped and sold as mulch, soil amendment, and animal bedding which would qualify as recycling diversion credit. Wood wastes sold as boiler fuel are regarded as "transformation" and do not count in the short-term planning period towards the City's diversion goals. After 1995 transformation can provide a maximum diversion credit of 10 percent towards the 50 percent requirement.

Yard wastes are easily collected at the source (curbside collection or drop-off). This collection method produces relatively contaminant-free materials which minimizes the processing cost and produces a high quality end-product that is more easily marketed. Residential yard waste can be collected loosely at the curb, in separate containers such as paper or plastic bags; or in rigid plastic containers (30-, 60-, or 90-gallon) by a standard refuse truck. Even though curbside yard waste collection is expensive, it has a relatively high rate of participation. Drop-off collection is the least expensive method, but is expected to have a lower rate of participation. A drop-off collection facility is best used as a complement to a scheduled curbside collection program.

A variety of processing alternatives are available to the City, which include windrow composting, aerated static piles, and in-vessel systems. Windrow and aerated static piles are the least expensive methods, require more land, and take longer to produce a finished product. In-vessel systems require more capital for equipment, but process material faster, and require less land.

The use of municipal solid waste (MSW), also referred to as mixed municipal solid waste (MMSW), involves composting the entire organic portion of the waste stream (food waste, yard waste, wood waste, and paper). Although this technology has been in use in Europe, it is not widely used in the United States. Markets for MSW compost are severely limited due to high contaminant levels.

MSW can also be co-composted with sewage sludge. This would restrict the market for the finished composting product to a higher degree than just MSW compost since sewage sludge may contain heavy metals that can end up in the final composting product. The EPA will release regulations in 1992 that may impact the use of sewage sludge composting products. It may be in the best interest of the City of Woodland to avoid the use of sewage sludge in any composting operation until these regulations are released.

## 6.1 GOALS AND OBJECTIVES

The following objectives for the short and medium-term planning periods are as follows:

- Continue the current residential curbside yard waste collection program in the short and medium-term planning periods.
- Provide source separated yard waste collection to selected commercial and industrial waste generators in the short-term planning period.
- Divert collected yard waste to the County's regional composting facility in the short-term planning period.
- Divert through the composting of commercial yard waste approximately 1.2 and 1.5 percent of the waste stream in the short and medium-term planning periods.
- Divert through the composting of residential yard waste approximately 10 percent of the waste stream in the short and medium-term planning periods.

In addition, the following compost marketing development efforts will be implemented by the City:

- Expand current markets by requiring municipal departments to give preferential consideration to the use of compost in maintenance of public lands.
- Promote the use of compost through public education efforts.
- Work with regional County planning agencies to develop cooperative marketing plan for compost and other recyclable materials.

- Support State legislation approving the use of compost as daily cover when compost markets are limited or unavailable.

## 6.2 EXISTING CONDITIONS

There are no existing composting programs in the City of Woodland other than a small amount of composting taking place through backyard composting. However, the City of Woodland currently has a source separated curbside collection program for yard waste. The program is mandatory and includes both single family dwellings and duplexes. The yard waste is placed in the street for collection and a street sweeper follows the collection to remove any material that was not picked up by the collection crew. Collection fees are based on lot size for single family dwellings and by unit for duplexes. The collected yard waste is currently disposed of at the Yolo County Central Landfill (YCCL).

### Landfill Disposal

A substantial quantity of compostable organic wastes generated in the City are currently disposed of at the YCCL. Table 6-1 presents the estimates of organic wastes which could be composted.

Table 6-1. Compostable Organic Wastes Disposed of by Woodland

| Waste Type | Quantity Disposed (TPY) | Percent of Total Waste Disposed |
|---|---|---|
| Paper* | 12,525 | 19 |
| Yard Waste | 13,417 | 20 |
| Wood | 4,028 | 6 |
| Food | 3,353 | 5 |
| Manure | 101 | 0.2 |
| TOTAL | 33,424 | 50 |

* Paper includes mixed and other paper categories from the Waste Generation Study.

## 6.3 EVALUATION OF ALTERNATIVES

As mentioned previously, the City of Woodland has a very successful residential yard waste collection program; however, this waste is not currently being composted. At present, all the collected yard waste is transported for disposal in the YCCL. A number of alternatives are available to the City to develop a composting program. These alternatives can be broadly classified into three categories: collection, processing, and siting. Presented below is a list of the alternatives considered within this component followed by an evaluation of each alternative.

### Collection Alternatives

Alternative 1. Continue Existing Curbside Collection (selected)
Alternative 2. Provide Commercial and Industrial Collection (selected)
Alternative 3. Establish Drop-off Collection Sites

### Siting Alternatives

Alternative 1. Establish Centralized Regional Site (selected)
Alternative 2. Establish Local Municipal Site

### Composting Process Alternatives

Alternative 1. Use Windrow Process
Alternative 2. Use Aerated Static Piles
Alternative 3. Use In-vessel Composting
Alternative 4. Use Anaerobic Composting

### 6.3.1 Collection Alternative Evaluation

Collection Alternative 1. Continue Existing Curbside Collection (Selected)

The current curbside yard waste collection program targeting leaves, grass, and tree and shrub prunings in the City of Woodland involves the source separation of this material by residents of single family dwellings into piles on the street. The yard waste is collected weekly by Waste Management of Woodland using a claw-equipped front loader and a packer truck with follow-up street sweeping. The material collected is disposed of at the YCCL.

Through selection of this alternative, the City would continue to provide separate yard waste collection services.

Effectiveness

The current collection program has been very effective in recovering yard waste generated from the residential sector. Based on the SWGS, the City of Woodland's curbside collection program currently disposes of 9,993 TPY or 93 percent of all the yard waste generated.

Hazards

Common hazards of curbside collection with no collection containers are:[1]

- Blowing yard waste;
- Cars driving over yard waste and scattering it in the streets;
- Automobile catalytic converters starting leaves on fire;
- Storm drain blockages;
- Parking and bicycle lane obstructions; and
- Contamination of yard waste by gravel, glass, and oil.

Ability to Accommodate Change

Any change in quantity and/or quality of source separated collection of yard wastes can be accommodated by changing collection patterns and frequency.

Consequences on Waste Stream Composition

Separate collection of yard waste has no effect on the composition of waste entering the landfill. This program in conjunction with a yard waste composting program would provide a significant reduction in the quantity of waste currently disposed.

Ability to be Implemented

A curbside collection of source separated yard waste is currently provided Waste Management of Woodland.

Need for Facilities

The existing program is fully operational and does not require any additional facilities.

Consistency with Applicable Local Policies, Plans, and Ordinances

A curbside collection program does not conflict with local policies, plans, or ordinances.

Institutional Barriers to Implementation

There are no institutional barriers to implementation.

Costs
This program is currently funded through yard waste collection fees based on residential lot size for single family dwellings and a per unit charge for multi-family dwellings. No additional costs are anticipated.

Market Availability
The collection alternative does not require end markets.

Technical Reliability/Public Acceptance
The current curbside collection program has proven to be an effective method for the collection of yard waste. Changes in quantity or quality of yard waste can easily be adapted to. The existing collection program has widespread support and participation.

Collection Alternative 2. Commercial and Industrial Collection (Selected)

The majority of yard waste generated from the commercial and industrial waste sectors is currently collected on normal collection routes and disposed of at the YCCL. Some businesses however, currently receive collection services for yard waste on a on-call basis. This material is also disposed of at YCCL. Through this alternative the franchised waste hauler would provide source separated yard waste collection services to several commercial/industrial accounts in the City.

Separate collection containers would be provided to appropriate businesses in the City for the source separation of yard waste. The bins would be serviced on a weekly basis and the collected yard waste transferred to a centralized receiving area or composting facility.

The City of Woodland would promote this collection service through commercial information materials and encourage local commercial landscapers to also divert collected yard waste to recovery/processing facilities.

Effectiveness
The source separation and collection of yard waste can be an effective means of recovering yard waste from the waste stream. Participation rates for the source separate/collection of yard waste can range from 50 to 90 percent. Based on the estimates of yard waste available in the commercial/industrial waste stream and assuming material recovery rates of at least 50 percent, approximately 1.2 percent and 1.5 percent diversion can be achieved in the short-term and medium-term planning periods.

Hazards
A slight increase in truck traffic would be the only result.

Ability to Accommodate Change
This source separation/collection alternative can be easily changed to suit any collection problem or constraint. Collection routes and frequency of collection can be altered as necessary.

Consequences on Waste Stream Composition
An effective source-separated yard waste collection program for commercial and industrial businesses in conjunction with a composting program will reduce the quantity of organic material in the waste stream.

Ability to be Implemented
A source separated yard waste collection program could be implemented in 6 to 12 months.

Need for Facilities
No facilities are necessary for the collection program.

Consistency with Local Policies, Plans, and Ordinances
A source-separated container collection program for yard wastes does not conflict with local policies, plans or ordinances.

Institutional Barriers to Implementation
There are no institutional barriers that would prevent implementing a containerized collection program, however, it may be difficult for some businesses to site containers on their property due to space limitations.

Costs
The number of businesses which will receive this service and the number of containers necessary to collect source separated yard waste cannot be determined at this time. Assuming however, that up to 250 commercial/industrial accounts will be served by this program, approximately $129,000 may be required for capital expenditures.

Collection cost for this program is estimated to range between $60 to $80 per ton. Assuming a 50 percent recovery rate for yard waste disposed, collection costs would range between $78,000 and $105,000.

Market Availability
Source-separated yard waste offers the best opportunity for development of markets because of its consistent quality as a result of its being free from most contaminants.

Markets for composted yard waste include landscape contractors, nurseries, agriculture, and residential users. Public sector users are parks, road and highway maintenance, and landfill cover. If there is still a surplus after the above markets have been explored then state agencies should be sought out. SB 1322 requires that the Department of General Services, the California

Department of Transportation, and the Department of Forestry and Fire Protection use yard waste compost.

Technical Reliability/Public Acceptance

Source-separated collection of yard wastes has been a reliable and proven method of collection for many communities. This method can be easily adapted to changes in quantity or quality of yard waste. This alternative should readily receive public acceptance since the existing curbside collection programs have widespread support and participation.

## Collection Alternative 3. Establish Drop-off Collection Sites

Drop-off collection sites can vary from unattended containers located at various sites throughout the City to fully equipped and staffed facilities that receive and process recyclable and compostable materials. A drop-off collection program could include unattended container sites, a centralized drop-off facility, or a combination of both.

Given the highly successful residential yard waste collection program in the City, a drop-off program would likely target yard waste generated from the commercial and industrial sources. A low cost alternative for the City could entail the siting of drop-off facilities (bin sites) at strategic points in the City to target commercial and industrial waste sectors. The collection containers would be serviced on a regular basis and the yard waste taken to a centralized location for preparation and processing for compost.

Effectiveness

Depending on drop-off locations, participation in the program could result from all waste sources in City. Given the highly successful residential curbside collection currently in operation, this program would likely target commercial/industrial businesses in the City. Assuming a participation rate of 10 to 30 percent, approximately 260 to 780 tons of yard waste can be recovered annually. This would result in an overall waste diversion rate ranging between 0.3 and 1.0 percent.

Hazards

If yard waste is not regularly transferred to the composting facility, there may be a problem with odors and vector (insects, rodents, birds) control. Odors may discourage people from using the site. Unattended containers may be vandalized or contaminated with other refuse.

Ability to Accommodate Change

Any change in quality/quantity of yard waste can be accommodated by changing the number, size and location of the sites. However, material contamination or illegal dumping can only be controlled through site supervision.

Consequences on the Waste Stream Composition
This alternative provides a means of recovering yard waste only. This program in conjunction with a composting facility would reduce the quantity of organic material currently disposed.

Ability to be Implemented
Drop-off collection could be implemented in the short-term planning period.

Need for Facilities
Drop-off facilities which would serve as collected sites may simply require locations for the siting of refuse dumpsters for yard waste recovery.

Consistency with Local Policies, Plans, and Ordinances
There are no conflicting policies, plans, or ordinances that would affect a drop-off facility.

Institutional Barriers to Implementation
Opposition to siting containers at various locations may be a barrier to implementation of this alternative.

Costs
Costs associated with unattended drop-off sites would include the cost of the site locations, containers, maintenance of the site, and material collection costs.

Container costs could range between $2,000 and $5,000 per site. Maintenance of the site would be performed by the waste hauler and is estimated to cost $2,000 annually. Assuming collection costs range between $60 to $80 per ton, collection and hauling costs are estimated to ranged between $47,000 and $62,000 annually.

Market Availability
Private sector end users are landscape contractors, nurseries, agriculture, and residential users. Public sector users are include parks, road and highway maintenance, and landfill cover. If there is still a surplus after the above markets have been explored, then state agencies should be sought out. SB 1322 requires that Department of General Services, the California Department of Transportation, and the Department of Forestry and Fire Protection use yard waste compost.

### 6.3.2 Compost Facility Siting Alternatives

Alternatives for the siting of a composting facility would include a facility located within or in the vicinity of the City of Woodland or a centralized location which would serve the region of Yolo County. A localized facility would likely be sized to process source separated yard waste generated and disposed of within the City. A centralized facility could receive and process source separated yard waste recovered through the City's collection programs as well as Yolo County. For either alternative, the facility could be owned and/or operated by private and

public sectors. While a composting facility could serve a single jurisdiction, a centralized site for the region may offer economies of scale, space availability, and administrative convenience not available through a city operation. Competition for limited markets would also be reduced through regional cooperative composting efforts. Centralized and local facility siting alternatives are evaluated below.

Siting Alternative 1. Establish Centralized Regional Site (Selected)

A centralized regional composting facility provides economies of scale in processing of source separated yard waste not realized through a local facility. This is largely do to the greater quantities of yard waste that can be process resulting in lower processing costs per ton. A centralized processing facility also provides for regional marketing efforts for finished compost reducing competition among jurisdictions for limited markets. A disadvantage to a centralized site is the transport distance to discharge source separated yard waste loads.

A composting and wood utilization program, operated by Valley By-Products, is currently in operation at the YCCL. During the short-term planning period, the County plans to assist Valley By-Products in facility permitting and in the development of strategies to increase the levels of diversion through this program.

Through this alternative the City would divert source separated yard waste, which is currently disposed of at YCCL, to the Valley By-Products facility located at YCCL. Participation in this program would not require any changes to the current yard waste collection program.

Effectiveness

A centralized regional site will be effective in diverting yard waste generated in the City of Woodland as well as that generated throughout the region. The alternative would not require any changes in current and proposed recovery programs and would provide the maximum levels of diversion possible. This alternative would also provide for regional marketing efforts reducing individual marketing efforts of participating jurisdictions.

Hazards

Please refer to discussion of Hazards summarized under Processing Alternative 1 in the following section.

Ability to Accommodate Change

A regional center can alter operations and marketing efforts as necessary. A regional facility located at YCCL can also utilize available equipment in the event of equipment failure and expand operations as needed. In the event that markets are limited or unavailable, finished compost product can also be utilized as a component in landfill daily cover operations.

Consequences on Waste Stream Composition
A composting operation will reduce the volume of waste disposed.

Ability to be Implemented
Expansion of the Valley By-Products facility is expected to take place in the short-term planning period.

Need for Facilities
Facilities are currently available for this operation.

Consistency with Local Policies, Plans, and Ordinances
There are no conflicting policies, plans, or ordinances that would preclude a composting facility. Expansion of current operations may require revisions to the landfill solid waste facilities permit.

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

Costs
Costs for the expansion of the YCCL composting operation are currently unknown. Costs for facility expansion will be funded through landfill tipping fees.

Market Availability
Please refer to Market Availability under Processing Alternative 1.

## Siting Alternative 2. Establish Local Composting Facility

Establishing a composting facility within the City of Woodland would require: 1) a siting study to identify viable site locations; 2) design, permitting, and construction of the facility; 3) operation of the facility through City services or a private contractor; and 4) marketing of the final compost product.

The main advantage to locating a facility in the City of Woodland would be a reduction in the number of collection vehicle trips to YCCL. Source separated yard waste collected from the City is currently transported to the YCCL for disposal. Disadvantages to developing a local composting facility would be the direct competition the City may experience for limited compost markets with other jurisdictions in the region and the higher costs per ton to process collected yard waste. In the event that markets may not be available, finished compost would likely have to be transported to YCCL for use as daily cover.

Effectiveness
A local site would be effective for composting yard waste generated in the City and would result

in a reduction in the quantity of waste transported to YCCL.

Hazards

Hazard associated with a local facility operation would be the same as those identified in the compost processing alternatives described in the next section. Please refer to Hazards under Processing Alternatives 1.

Ability to Accommodate Change

A local composting facility is more likely to adapt to specific local changes in a community than a regional site. In the event that markets are unavailable, storage space for final compost product could be limited.

Consequences on Waste Stream Composition

A composting operation will result the reduction of the volume of waste processed.

Ability to be Implemented

A local facility could be implemented and in operation toward the end of the short-term planning period.

Need for Facilities

A composting facility may require one acre of land for every 1,400 to 2,500 tons of material processed and composted depending on the technology chosen for operation.

Consistency with Local Policies, Plans, and Ordinances

There are no conflicting policies, plans, or ordinances that would preclude a composting facility. A permit from the State Regional Water Quality Board may be required for disposal of the leachate that is generated. The CIWMB will require a solid waste facility permit. A composting facility will be consistent with local policies as long as it is located in an area that has been zoned for this use.

Institutional Barriers to Implementation

Public opposition may result depending on proposed locations.

Costs

Site development costs are estimated at $10,000 per acre. Capital costs for equipment are included in the Processing Alternative evaluations.

Market Availability

Please refer to Market Availability under Processing Alternative 1.

### 6.3.3 Composting Process Alternatives

Selection of a compost process alternative by the City is only relevant if the City plans to develop a local processing facility through City operations or through a franchise agreement with a private contractor. Should the City elect to develop, construct, and operate a local composting facility or work with a private contractor to provide this service, process alternatives will likely be determined based on the availability of composting sites and the quantity of yard waste available to be processed.

Selection of a processing alternative is not necessary if the City plans to divert yard waste through the County's regional yard waste processing facility. The processing alternative proposed by the County involves working with the private operator, Valley By-Products, to expand existing composting and wood waste recovery and utilization operations. Yard waste collected through the City's source separated collection programs could be diverted through this operation.

This section describes and evaluates the composting methods of windrows, static piles, and in-vessel, and anaerobic systems. While static piles and in-vessel composting are complex procedures, the windrow option can be operated with various levels of technology and energy input. Anaerobic composting provides energy as well as compost, but requires a large input stream.

Processing Alternative 1. Windrow Process

In this system, organic materials are placed in windrows (elongated piles) that are 8 to 15 feet wide and 5 to 10 feet high, and usually at least 50 feet long (no maximum length). The size of the windrows depends on the technology of operation and weather conditions. In colder weather, the piles should be as large as possible to retain the heat that is internally generated. Recycled compost or wood chips can be placed over the windrows for insulation.

Windrow composting can be approached with low-, medium-, or high-level technology. The low technological approach is to turn windrows once per year. Windrows are approximately 12 feet high and 24 feet wide for this approach. The only equipment required would be a front loader to construct the periodically turn the windrows. The compost can be ready for market in one to three years, depending on the climate. This is the most economical method of composting, if space is available. This option requires a large buffer zone for odor control.

The "Low-level" technology approach utilizes a two- or three-stage process for composting. Initially, the waste to be composted is placed in windrows that are approximately 6 feet high and 12 to 14 feet wide which are turned frequently in the first month. After the first month, two windrows are combined for the second stage of composting. After 10 to 11 months, this compost can be pushed to the edge of the facility for curing in the final stage of the composting

process. The final product is ready for market in 16 to 18 months. This process requires a considerably smaller buffer zone than the minimal technology approach.

The "intermediate-level" approach requires turning the windrows every week. This process will produce compost in the shortest amount of time - 4 to 6 months.

The last approach is referred to as the "high-technology" approach which is to aerate the windrows mechanically every few days (forced aeration). The composting product is ready in about 3 to 5 months.

Effectiveness

The windrows method is a very effective way to process yard waste. Depending on the energy input to the system, the time it takes to develop the final product can vary from 3 months to 3 years. Windrows can be utilized with a variety of technological levels and can be modified to work in any climate. This technique facilitates the composting of all of the yard waste that is delivered to the facility (see collection alternatives for specific quantities).

Hazards

The common hazards associated with composting facilities are odors, contaminants, and leachate. There is also a potential for vector problems. There also can be hazards associated with equipment operation, but these will be minimized by properly training the equipment operators.

The most common complaints directed at windrow processes are odor complaints. This can be overcome by treatment and proper site and process management. Some process techniques to control odors are:

- Reduce compost activities during high odor periods
- Turn windrows during low wind conditions
- Turn windrows frequently to prevent anaerobic conditions
- Use low odor amendments

The highest correlation for odor generation is the exposed surface area to volume ratio of the windrow. To a certain extent, large windrows emit less odors than small windrows. If a windrow becomes anaerobic, it could potentially be very odorous.

The presence of contaminants in the final compost product can be disastrous to marketing efforts. This hazard can be avoided by visually screening the input waste stream for contaminants and removing them before the material is placed in windrows.

The leachate that is generated from the windrow process can potentially contaminate local water sources. This can be controlled by collecting and treating or recycling the effluent. Alternatively, the leachate can be disposed by means of an evaporation pond.

Vectors can be controlled by revising certain aspects of the windrow process. Improved turning techniques, moisture adjustments, temperature adjustments, and trapping are effective methods for vector control.

Wind-blown litter can be controlled by a chain-link fence surrounding the property. Dust can be controlled by misting the material as it is received.

Ability to Accommodate Change

Windrow composting is adaptable to many economic, technological, and social changes. The processing technology is easily changed from low to high levels of input with some equipment changes. The process can be performed for any economic condition that is warranted. The process can adapt to social changes. For example, if the public does not want to see the facility, it can be enclosed.

Consequences on Waste Stream Composition

A composting facility may result in reduced amount of methane gas production at the YCCL.

Ability to be Implemented

A windrow composting operation can be implemented in the short term. Approximately 18 to 24 months will be required to permit and build the facility.

Need for Facilities

A site will be necessary for the compost operation. Approximately one acre for every 7,000 cubic yards (1,400 tons) of compostable yard waste will be needed. Assuming an annual input stream of 18,000 tons in the medium-term planning period, an 13 acre facility would be necessary.

Consistency with Local Policies, Plans, and Ordinances

There are no conflicting policies, plans, or ordinances that would preclude a composting facility. A permit from the State Regional Water Quality Board may be required for disposal of the leachate that is generated. The California Integrated Waste Management Board (CIWMB) requires a solid waste facility permit.

Institutional Barriers to Implementation

There are no institutional barriers to composting yard waste. If the jurisdictions decide to move into sewage sludge composting in the future, there may be institutional barriers to the use of the final product. Sewage sludge composting is currently under review by the EPA. Municipal solid waste composting may lack public acceptance as the final product may be contaminated with plastics or other material difficult to compost.

Costs

Typical costs for a composting operation are in facility development, equipment procurement,

material processing, marketing, and program administration. These costs are offset by the benefits would include revenues received from selling the finished compost and avoided landfill tipping fees.

Initial site work for the development of a windrow composting facility may be as high as $10,000 per acre - approximately $130,000. Depending on the levels of composting processing undertaken, equipment expenditures for this alternative could be as high as $325,000.

Operational costs for conventional windrow processing range from $20 to $30 per ton processed.

Market Availability

The market for compost produced from Woodland's yard waste will depend on several factors including: quality of product produced, demand by local government, demand by state government, and demand by local residents.

The compost product quality will be determined largely by process control, screening of the final product, and public perception of the final product (see Public Education Component). There generally exists a direct correlative relationship between the quality and marketability of municipal compost.

The compost can be used by both the public and private sectors. Different quality products (screened/unscreened) can be marketed to different sectors. The public will require a high quality product for horticultural use. It may be necessary to give the product away at first to build up confidence in the compost. The high quality compost can be marketed to nurseries, land developers, golf courses, and other private users.

If all the compost cannot be marketed locally then the City can explore the possibility of marketing the compost to state agencies. Senate Bill 1322 requires that the Department of General Services, the California Department of Transportation, and the Department of Forestry and Fire Protection use yard waste compost.

Technical Reliability/Public Acceptance

Windrow composting techniques are relatively simple and reliable. If a few parameters are controlled, such as temperature, aeration, and moisture content, then the system will operate on its own and be very reliable. Windrow composting is publicly acceptable if odors are controlled.

Processing Alternative 2. Aerated Static Piles

With static pile composting, organic wastes are aerated by blowers, similar to the high technology operation of windrows. The piles can be much larger than standard windrow piles

because they are not limited by the size of equipment used to turn the windrows. The blower can be controlled by timers or by a temperature feedback system. Aerated composting has less odor forming potential than conventional windrow composting. This is because the conventional windrow composting operations have a tendency to operate under anaerobic conditions. Anaerobic composting releases more odors than aerobic composting. Composting of strictly yard waste or wood with static piles is rare, aerated static piles are commonly used to compost sewage sludge.

Effectiveness

This option is effective for co-composting yard waste with sewage sludge or other organic materials, but is not recommended for composting yard waste alone. A manure/yard waste mix would be suitable for composting with an aerated static pile system. The compost process would be as effective as the collection system that feeds it (see collection alternatives for specific quantities).

Hazards

The common hazards associated with composting facilities are odors, contaminants and leachate. Vectors can be a hazard if the facility is not properly operated. There can be hazards associated with equipment operation, but these will be minimized by properly training the equipment operators.

The most common complaint direct at composting facilities is odor. Aerated static piles offer better odor control than conventional windrow processes. If the pile is aerated by pushing air up through the pile from the bottom, then the compost acts as a filter for the odors. If the air is sucked through the pile (vacuum at bottom), then the air stream can be treated before release to the atmosphere.

The presence of contaminants in the final product can be disastrous to marketing efforts. This hazard can be avoided by visually screening the input waste stream for contaminants and pulling them out before the material is placed in an aerated static pile.

The leachate that is generated from the compost process can potentially contaminate local water sources. This can be controlled by collecting and treating or recycling the effluent.

Trapping can be effective in vector control.

Ability to Accommodate Changes

Aerated static pile composting is adaptable to many economic, technological, and social changes. It can easily be converted to a windrow composting facility.

Consequences on Waste Stream Composition

A composting facility would reduce the volume of organic wastes generated.

Ability to be Implemented
An aerated static pile composting facility can be implemented with-in the short-term planning period.

Need for Facilities
A site for compost operations would be necessary.

Consistency with Local Policies, Plans, and Ordinances
There are no conflicting policies, plans, or ordinances that would interfere with the construction of a composting facility. Depending on the location, a permit from the State Regional Water Quality Board may be required for disposal of the leachate that is generated. A conditional use permit may be required depending on the local zoning ordinances. A solid waste facility permit will be required by the CIWMB.

Institutional Barriers to Implementation
There are no institutional barriers to composting yard waste. If the jurisdictions decide to move into sewage sludge composting in the future, there may be institutional barriers to the use of the final product. Sewage sludge composting is currently under review by the EPA.

Costs
Typical costs for a composting facility are in site development, equipment procurement, material processing, marketing, and program administration. Revenue sources for a composting facility include: revenues from selling the finished compost and avoided landfill tipping fees. Capital costs for an aerated static pile composting facility are similar to those for windrow composting. While a windrow turner is not needed for this process, a ventilation system is. Operational costs are approximately $30 per ton of yard waste processed.[2] This could run as high as $330,000 per year.

Market Availability
Please refer to Market Availability in Processing Alternative 1.

Technical Reliability/Public Acceptance
Aerated static pile composting techniques are relatively simple and reliable. A temperature feedback system to control aeration may be used. By controlling the temperature, aeration, and moisture content, a system can be designed that is very reliable. Aerated static pile composting is acceptable to the public because of odor controls. The facility can be enclosed if there are public objections to its appearance.

Processing Alternative 3. In-Vessel Composting

This process entails the use of a fully- or partially-enclosed, often fully automated operation involving mechanical turning devices with feedback controls and/or forced aeration. Advantages

of this method include rapid processing, avoidance of weather related problems and inefficiencies, more complete process and odor control, and less space required.

If the City of Woodland decides to compost all of the organic material in its municipal solid waste with an in-vessel system they could divert 48.5 percent of the waste stream that is currently going to landfills. This option would make significant strides toward the state mandated diversion levels, but might significantly affect the marketability of the compost due to the quantity of the compost produced. The compost may possibly be used as landfill cover material; but may be shut out of other markets because of the expected regional availability and quantity of compost in the near future.

Effectiveness

This option is effective at removing compostable materials from the waste stream, but its expense and complexity will not make this a feasible option unless the input stream is large and other materials are composted with the yard waste. This compost process would be as effective as the collection system that feeds it.

Hazards

The common hazards associated with composting facilities are odors, contaminants and leachate. Vectors are not usually a problem with enclosed facilities. There can be hazards associated with equipment operation, but these will be minimized by properly training the equipment operators.

The most common complaint directed at composting facilities is the odor. In-vessel composting facilities offer better odor control than conventional windrow processes. Since the process is enclosed, the odors can be treated as they are released from the vessel.

The presence of contaminants in the final product can be disastrous to marketing efforts. This hazard can be avoided by visually screening the input waste stream for contaminants and pulling them out before the material is placed in the vessel.

The leachate that is generated from the compost process can potentially contaminate local water sources. This can be controlled by collecting and treating or recycling the effluent.

Vectors are usually not a problem with in-vessel systems.

Ability to Accommodate Change

Once a system is designed, it is not particularly flexible in response to changing economic, technological, or social circumstances without economic penalties.

Consequences on Waste Stream Composition

Composting will reduced the volume of organic waste disposed.

Ability to be Implemented

An in-vessel composting facility may be implemented in the short term. This method of composting generally is used for composting municipal solid waste. There are many plants of this type in Europe, but experience in the United States is very limited. This technology has been proven effective for composting municipal solid waste and sewage sludge, but has not been applied to yard waste. A pilot program should be done before committing to this option.

Need for Facilities

A site will have to be found for the composting operation. Site improvement costs can be minimized if a site is chosen that meets the criteria for a composting facility, given in the siting section. A grinder will be needed to prepare the material for composting. Conveyors may be needed to move the material from the grinder to the vessel and from the vessel to the final product area. The facility size requirements are less than the requirements for the windrow or aerated static pile processes. Approximately one acre per 2,500 TPY would be needed for an in-vessel composting operation. Utility hookups will be needed.

Consistency with Local Policies, Plans, and Ordinances

There are no conflicting policies, plans, or ordinances that would affect a composting facility. Depending on the location, a permit from the State Regional Water Quality Board may be required for disposal of the leachate that is generated. The CIWMB will require a solid waste facility permit for the site.

Institutional Barriers to Implementation

There are no institutional barriers to composting yard waste. If the jurisdictions decide to move into sewage sludge composting in the future, there may be institutional barriers to the use of the final product. Sewage sludge composting is currently under review by the EPA. Contaminants in MSW compost may limit public acceptance.

Costs

Typical costs for a composting facility are in collection alternatives, processing, storage, marketing, program administration, public education and technical assistance. These costs are offset by the benefits which include: revenues received from selling the finished compost; avoided costs from using the finished compost instead of purchasing a similar product; and avoided landfill tipping fees.

Capital costs for in-vessel systems can be four to seven times higher than those for windrow or aerated static pile systems. An in-vessel system will require an initial investment or approximately $2 million. Operation and maintenance costs range between $40 and $80 per ton of yard waste processed.

Market Availability

Please refer to Market Availability under Processing Alternative 1.

Since this system is automated, there is a po
technologies on the market for in-vessel compost facilities, but only a few
United States. This method is acceptable to the public because the whole system is enclosed, creating minimal odor or visual problems.

## Processing Alternative 4. Anaerobic Composting

Anaerobic composting is the process of producing compost without air. This process produces two products: compost and biogas. Biogas is a mixture of approximately 50 percent carbon dioxide and 50 percent methane. The biogas can be burned to generate electricity or it can be upgraded to pipeline quality natural gas and sold to utilities. The compost product that is produced is similar to that which is produced in aerobic processes.

### Effectiveness

This option is effective at removing compostable materials from the waste stream, but its expense and complexity render this option generally inapplicable to yard waste unless the input stream is at least 30 tons per day.[3] This compost process would be as effective as the collection system that feeds it.

### Hazards

There can be hazards associated with equipment operation, but these will be minimized by proper training of equipment operators. Methane gas is explosive and must be properly controlled. Vectors are usually not a problem with enclosed systems. For a further discussion of hazards, please refer to Hazards under Processing Alternative 1.

### Ability to Accommodate Change

Anaerobic composting is adaptable to many economic, technological, and social changes. It can be converted to an aerobic composting facility, though this conversion would be very costly.

### Consequences on Waste Stream Composition

Composting will reduced the volume of organic waste disposed.

### Ability to be Implemented

Approximately two to three years will be needed to permit, design, and build an anaerobic facility. A windrow composting operation can be implemented in the short term to bridge the gap until the facility will be in operation.

### Need for Facilities

A site for the facility will be necessary. Facility requirements would include a grinder to prepare the material for composting. Conveyors may also be needed to move the material from the grinder to the composting location and from the composting location to the final product

area. Anaerobic digesters and a methane gas control system are necessary. The site may be expanded in the future by increasing the energy available to the system and by the use of buffer areas which are used now for storage and curing.

Consistency with Local Policies, Plans, and Ordinances

There are no conflicting policies, plans, or ordinances that would affect a composting facility. Depending on the location, a permit from the State Regional Water Quality Board may be required for disposal of the leachate that is generated. The CIWMB will require a solid waste facility permit. A local use permit may be required.

Institutional Barriers to Implementation

There are no institutional barriers to composting yard waste. If the jurisdictions decide to move into sewage sludge composting in the future, there may be institutional barriers to the use of the final product. Sewage sludge composting is currently under review by the EPA.

Costs

Typical costs for a composting program would include site costs, material processing costs, and storage, marketing and program administration costs. Potential revenues and cost savings come from selling the finished compost, avoided landfill tipping fees, and the sale of methane generated by the process.

Anaerobic composting is not widely practiced; therefore, detailed costs are not available. Processing costs are estimated to range between $40 to $60 per ton. Capital costs will be higher than for a windrow process due to the gas control systems that are necessary.

Market Availability

The market for compost produced by Woodland will depend on several factors including: whether the facility is privately or publicly owned, demand by local government, demand by state government, demand by local residents, quantity and quality of product produced. Biogas can be used on-site, sold to local industries, or upgraded and sold to utility companies. One use biogas is in an internal combustion engine to generate electrical power that can provide a revenue stream to provide support for the composting operation. For a more complete discussion of aftermarkets for compost products, please refer to Market Availability under Processing Alternatives 1. Windrows.

Technical Reliability/Public Acceptance

Anaerobic composting techniques, although not in common use, are relatively simple and reliable once the system has been designed and installed.

## 6.4 SELECTION OF PROGRAMS

Program selections by the City are based on the City's desire to provide Woodland residents and

businesses the opportunity to participate in waste diversion programs on a voluntary basis. Program selections are also based on providing the most cost effective programs available to achieve the City's waste diversion goals and to participate in County efforts to provide regional waste management programs. The following alternatives were selected for implementation in the short-term planning period and are expected to be in operation throughout the medium-term planning period.

**Collection Programs Selected**

Collection Alternative 1. Continue Existing Curbside

The City currently offers separate residential curbside collection of yard waste on normal refuse collection days. This program has been very successful in the collection of yard waste and will continue through the short and medium-term planning periods. This program is currently funded through refuse collection fees.

Collection Alternative 2. Provide Commercial/Industrial Collection

Based on the SWGS, the quantity of yard waste generated from the commercial/industrial waste sector is approximately 2,600 tons annually or 3 percent of all waste generated. In an effort to maximize the quantity of waste diverted and to provide commercial/industrial businesses the opportunity to participate in yard waste diversion programs, the City has selected the source separated yard waste collection program for the commercial/industrial waste sectors.

Yard waste collection operations for the commercial/industrial businesses will likely entail the use of separate containers or bins for the source separation of yard waste. Containers would be serviced on a weekly basis. The collected yard waste would then be transported to a compost processing facility for diversion.

This program will be implemented by Waste Management of Woodland during the short-term planning period with promotion assistance from the City. Funding for this service will be provided through the commercial/industrial refuse collection fees.

Facility Siting Alternative 2. Centralized Regional Site

This alternative has been selected for implementation in the short-term planning period due to the economies of scale achieved through regional programs and the lower costs associated with the expansion of the existing YCCL composting operation. This existing operation provides the City the opportunity to achieve maximum diversion levels and also the ability to participate in cooperative regional marketing efforts.

Expansion of the existing facility is expected to take place in 1992. Yard waste diversion for

the City is expected to take place during the forth quarter of 1992.

## 6.5 PROGRAM IMPLEMENTATION

Implementation schedules which include responsible entities, costs, and funding sources, for the selected collection programs are summarized in Tables 6-2 and 6-3. Implementation of the regional composting facility is expected to take place in 1992 and will be responsibility of the Yolo County Public Works Department. Funding for that program will be through the County Sanitation Enterprise Fund.

Table 6-2. Implementation Schedule for Residential Yard Waste Collection

| Task | Responsible Entity | Start Date | Completion Date | Funding Source | Cost |
|---|---|---|---|---|---|
| Continue Existing Residential Yard Waste Collection | Franchised Waste Hauler | Ongoing | Ongoing | Rate Structure | N/A |
| Begin Composting at Regional Site (YCCL) | County PWD | 10/92 | Ongoing | CSEF* | N/A |

* CSEF - County Sanitation Enterprise Fund.

Table 6-3. Implementation Schedule for Commercial/Industrial Yard Waste Collection

| Task | Responsible Entity | Start Date | Completion Date | Funding Source | Cost |
|---|---|---|---|---|---|
| Identify large commercial/industrial yard waste generators | Franchise Waste Hauler/ Recycling Coordinator | 9/92 | Ongoing | Rate Structure/ City Funds | Staff Time 120 hours |
| Provide program promotion | Recycling Coordinator | 12/92 | Ongoing | Rate Structure | Included in Public Education Costs |
| Begin commercial/ industrial yard waste collection | Franchise Waste Hauler | 10/92 | Ongoing | Rate Structure | $105,000 annually |
| Monitor program effectiveness | Recycling Coordinator | 12/92 | Ongoing annually | City Funds | Staff Time 20 hours annually |

## 6.6 MONITORING AND EVALUATION

To ensure that selected composting programs will meet desired goals and objectives, programs will be monitored as follows:

### Collection Alternative 1: Residential Curbside Collection

Objective

The objective of this alternative will be to continue to collect source separated yard waste at curbside in the short and medium-term planning periods. The SWGS indicates that a limited quantity yard waste is currently disposed with normal residential refuse. City goals will also be to promote participation in the collection program and to reduce the quantity of yard waste in the disposed waste stream.

Responsible Entities

Recycling Coordinator

Criteria/Methods of Evaluation

The City will periodically monitor the quantity of yard waste disposed with normal refuse. This monitoring program is scheduled to take place in the fall of 1992 and 1994. The criteria utilized to determine the level of program effectiveness will be based on the pounds per household discarded.

Contingency Plan If Shortfall

Should monitoring indicate that the quantity of yard waste discarded per household is at unacceptable levels, refuse collection rates will be evaluated and may be revised to encourage source separation.

### Collection Alternative 2: Provide Commercial/Industrial Collection

Objective

Program objectives are to divert approximately 1.2 percent of the waste stream by 1995 and 1.5 percent of the waste stream by the year 2000 through the source separation and collection of yard waste generated from the commercial and industrial waste sectors. To achieve these goals, the franchise waste hauler will offer yard waste collection services to specified commercial and industrial accounts throughout the short and medium-term planning periods.

Responsible Entities

Franchised waste hauler.

Criteria/Methods of Evaluation

Criteria to be utilized to evaluate program success will be based on the number of commercial/industrial accounts which are appropriate for this program. This baseline number of accounts will be established in the short-term planning period. Program success will be measured by the number of accounts contacted and the number of company programs established to divert yard waste through source separation collection. Target goals will be set annually to increase the number of accounts utilizing this service.

Contingency Plan if Shortfall

Should the City fall short in meeting annual target goals, the City will increase it's efforts to contact commercial/industrial accounts through the City Recycling Coordinator. Commercial refuse collection rates may be evaluated to increase participation in the program.

Facility Siting Alternative 2. Centralized Regional Site

Objective

The City has selected the centralized regional processing facility option for the composting of source separated yard waste. The main objective for the City will be to deliver source separated yard waste with as little contamination as possible.

Responsible Entities

The responsible entities will be the City Recycling Coordinator and the franchised waste hauler.

Criteria/Methods of Evaluation

The criteria to be utilized to measure program effectiveness will be based on the percent contamination of yard waste received at the regional processing facility. Levels of contamination will also be observed by the franchised waste hauler as source separated yard waste is collection for diversion.

Contingency Plan If Shortfall

Should levels of contamination become unacceptable, the sources of contamination will be by the waste hauler.

## FOOTNOTES

1. Mark D. Selby, June 1989, Yard Waste Collection, *BioCycle*, pp. 52-54.

2. Los Angeles Department of Public Works, April 1989, Recycling Implementation Plan Appendices, p. D-74.

3. Gene Logsdon, October 1990, Anaerobic Composting Gains Greater Support, *BioCycle*, pp. 42-48.

# SECTION 7

## SPECIAL WASTE COMPONENT

Special wastes are any solid wastes that present a hazard to human health or the environment if not properly handled or wastes that require unique handling or disposal methods because of physical characteristics. Handling and disposal of special wastes may also require permits from one or more state agencies. The California Integrated Waste Management Board defines special wastes as the following:

- Ash
- Nonhazardous sewage sludge
- Nonhazardous industrial sludge
- Asbestos
- Auto shredder waste
- Automobile bodies
- Other special wastes

Other special wastes can include bulky and hard-to-handle wastes such as furniture, refrigerators, and tires as well as potentially hazardous materials such as biomedical wastes generated by medical facilities. Special wastes generated in the City of Woodland and addressed in this component are the following:

Sewage sludge is the waste derived from the treatment of waste water by water pollution control plants. Depending on its content, sewage sludge may be classified as hazardous or nonhazardous. If de-watered sewage sludge meets the nonhazardous criteria of the State Water Resources Control Board, it may be disposed of in a municipal landfill. If the sewage sludge contains significant levels of heavy metals (i.e., copper, cadmium, chromium, lead, nickel, mercury, or zinc), it is considered hazardous and must be disposed of accordingly.

Industrial sludge is generated by industries that operate pretreatment programs for industrial waste water. Such pretreatment is usually required when the waste water contains materials that can pose a hazard to the safe and effective operation of publicly-owned treatment plants. Industrial sludge may contain constituents that require it to be classified as a hazardous waste, thus requiring disposal at a Class I landfill.

Tire waste consists of used tires, an inert waste that may legally be disposed of in any type of landfill. Landfilling tires presents some special difficulties because tires are resilient and have a tendency to "float" to the landfill surface where they can serve as vector habitats for rats and mosquitos.

Infectious wastes or biomedical wastes are classified as hazardous wastes and include:

- Wastes from biological laboratories and medical clinics
- Pathological specimens such as human and animal tissues
- Contaminated medical equipment such as syringes, needles, bags, bottles, etc.
- Human dialysis waste
- Infected animal carcasses
- Any other contaminated material which presents a significant danger of infection

White goods are large household and industrial appliances, such as stoves, refrigerators, and clothes washers and dryers. These items cannot be compacted and present a space problem at landfills. In addition, refrigeration units contain freon, a material that is hazardous when vaporized.

Concrete and Asphalt are materials used in construction and/or road work. Concrete is a product of sand, gravel, and cement. Asphalt is a tar-like substance mixed with sand and gravel.

Construction and Demolition Debris are materials resulting from construction activity. These materials consist primarily of wood (construction grade and pressed board), metals, inert solids, garden wastes, corrugated cardboard, and other mixed wastes.

Bulky Wastes generally include mattresses, furniture, and other potentially re-usable household items.

## 7.1 GOALS AND OBJECTIVES

Diversion alternatives selected to target special wastes involve participation by the City in the County's integrated waste management programs to target self-haul waste generators and construction and demolition contractors. Through these programs, the City will promote the source separation of asphalt and concrete at construction sites and promote the use of the County's "self-haul bin transfer" program to Woodland residents.

Specific goals and objectives include:

- Divert through the above programs 4.4 percent of the waste stream in the short-term and 5.4 percent the the medium term planning period.

- Promote the use of the YCCL self-haul waste recovery program and encourage residents of Woodland to divert white goods and other wastes not targeted through current diversion programs to this recovery operation.

- Promote the source separation of inert wastes through public education efforts.

- Assist the County in regional market development efforts and consider revising current City construction specifications requiring percentages of recovered A/C materials for new construction.

Table 7-1 summarizes the quantity of special wastes and other construction and demolition materials available through self-haul sources which can be targeted through diversion programs.

Table 7-1. Summary of Special Wastes and Other Materials Available Through Self-Haul and Commercial/Industrial Sources

| Waste Type | Amount Currently Generated (TPY) | Amount Available Short-Term (TPY) | Amount Available Medium-Term* (TPY) |
|---|---|---|---|
| Corrugated Cardboard* | 84.0 | 84.0 | 120.0 |
| Ferrous Metals* | 192.4 | 192.4 | 274.9 |
| White Goods | 68.3 | 68.3 | 98.0 |
| Grass, Leaves* | 67.7 | 67.7 | 96.8 |
| Prunings* | 146.3 | 146.3 | 209.1 |
| Tires | 138.4 | 102.3 | 146.0 |
| Wood* | 628.7 | 628.7 | 898.3 |
| Wood (pressed)* | 276.4 | 276.4 | 394.4 |
| Asphalt | 1,627.6 | 1,627.6 | 2,325.2 |
| Concrete | 1,688.9 | 1,688.9 | 2,412.5 |
| Totals | 4,918.7 | 4,882.6 | 6,975.2 |

* Generated through Construction & Demolition activities

## 7.2 EXISTING CONDITIONS

This section provides a description of the current practices within the City of Woodland for each waste type generated. None of the programs outlined below are expected to decrease or be phased out during the planning period. Applicable regulatory requirements are also included.

Sewage Sludge

The City of Woodland Water Pollution Control Plant is located at address 42929 County Road 24. The waste water entering the facility receives treatment utilizing an activated sludge system.

Septage is not accepted for disposal. The sludge, following treatment in oxidation ditches, receives further anaerobic treatment in on-site stabilization ponds. The existing stabilization pond system will potentially process all sludge accumulation for approximately 20 years.[1]

The City of Woodland's Beamer Street Treatment Plant is currently off-line. The City of Woodland is working with the Central Valley Regional Water Quality Control Board (CVRWQCB) to provide an approved sampling plan for the sludge, which settled in the bottom of the ponds, to facilitate potential land disposal.[2]

The City of Woodland Water Pollution Control Plant is under the jurisdiction of the CVRWQCB. The permit to operate is current under CVRWQCB Order No. 87-093. The treatment plant is also under the jurisdiction of the Yolo County Air Pollution Control District. No permits are currently required or issued by this agency.[3]

Industrial Sludge

City of Woodland Ordinance No. 1031 prohibits the disposal of industrial sludges into the waste water collection system. Nonhazardous industrial sludges are collected through an interceptor/clarifier system. The nonhazardous industrial sludge, including grease, is pumped by interceptor pumper trucks. The greases may be recycled by an area rendering company. The sludges are generally disposed at the Sacramento Regional Water Pollution Control Plant.[4] The Yolo County Landfill does not accept these sludges. They must be transported out of the County for disposal.[5]

Tire Waste

Based on the waste generation analysis, 102 TPY of discarded tires account for approximately 0.2 percent of the wastes generated from the residential and commercial/industrial waste sectors. Current tire disposal fees at the Yolo County Landfill range from $1 to $3 per tire or $60 per ton. The landfill operates an effective salvaging program whereby tires are placed in a designated area and periodically transported for shredding and temporary landfilling. These landfilled tire shreds will potentially by recovered and incinerated.[6]

Waste tires generated by commercial dealers in the City are diverted from disposal by contracting with a tire recycling company for regular tire pickup service. Commercial tire dealers in the City currently divert approximately 36.1 TPY of used tires.[7]

Infectious Waste

Infectious (biomedical) wastes are generated by the medical facilities located in the City of Woodland. Current disposal practices include pick up by licensed haulers for treatment and disposal outside of the area, sterilization on-site followed by landfill disposal, and incineration on-site with the ash removed as a hazardous waste by a licensed hauler for disposal outside of the area.[8]

White Goods

The Yolo County Landfill currently accepts white goods for disposal. The City of Woodland, through the franchised waste hauler, conducts annual cleanups during which bulky items and white goods are picked up on the routine residential refuse collection days. The white goods are disposed of at the Yolo County Landfill or recycled through a scrap metal dealer. Based on the Solid Waste Generation Study (SWGS), approximately 68 TPY of white goods are disposed annually.

Concrete and Asphalt

The SWGS identified 1,678 TPY of concrete and 1,251 TPY of asphalt currently disposed of at the YCCL.

Waste consisting of concrete, asphalt and rock is currently salvaged at the YCCL and utilized as wet weather road base. This material originates from construction activity in the City.

Total diversion of inert solids generated in Woodland in 1991 was 11,487 TPY or 13.6 percent of all waste generated.

## 7.3 EVALUATION OF ALTERNATIVES

Special wastes which can be targeted for waste diversion include concrete and asphalt generated from industrial sources, and white goods and construction and demolition debris generated from self-haul sources. The following recovery alternatives to landfilling these materials are described and evaluated in this section:

Alternative 1. Self-Haul Bin Transfer Operation (selected)
Alternative 2. Concrete and Asphalt Recycling (selected)

Alternative 1. Self-Haul Bin Transfer Operations

"Self-haul bin transfer operations" (landfill salvaging) involves the manual sorting of refuse to recover reusable materials from the mixed waste stream. The County Department of Public Works is currently developing a "self haul bin transfer operation" at YCCL to target wastes generated from self-haul sources - waste generators hauling their own waste to the landfill. Through this alternative the City would participate in this regional County waste management program by promoting the use of this facility by City residents and other Woodland waste generators.

Materials targeted from self-haul sources would include but are not limited to:

- White Goods; and
- Construction and Demolition (C/D) Debris.

Construction and demolition debris generated from self-haul sources consists of a variety of waste types such as cardboard, wood waste, yard waste, asphalt and concrete, and other materials. Table 7-2 summarizes the targetable waste types available in self-haul debris.

Self-haul waste recovery operations are scheduled to commence at YCCL during the 4th quarter of 1992.

Effectiveness

Targeting special wastes and other materials through the County's self-haul bin transfer program will result in a material recovery rate of 1,185 TPY or 1.4 percent of waste generated. Estimated of waste diversion through this program is summarized in Table 7-3.

Table 7-2. Projected Amounts Diverted by Self-Haul Bin Transfer for Each Waste Type

| Waste Type | 1990 Tonnage Available (TPY) | Diversion Rate (%) | Amount Diverted (TPY) |
|---|---|---|---|
| Corrugated Cardboard * | 84.0 | 80 | 67.2 |
| Ferrous Metals * | 192.4 | 80 | 153.9 |
| White Goods | 68.3 | 100 | 68.3 |
| Grass & Leaves * | 67.7 | 80 | 54.0 |
| Prunings * | 146.3 | 80 | 117.0 |
| Wood * | 628.7 | 80 | 502.9 |
| Wood (treated) * | 276.4 | 80 | 221.1 |
| Total | 3,453.8 | --- | 1,184.4 |

* Available through self-haul construction and demolition debris.

Hazards

Health and safety hazards associated with salvaging are similar to those inherent in all landfill operations, such as the dangers of working in close proximity to large equipment and machinery.

Ability to Accommodate Change

Salvaging in this type of program is very adaptable to changing economic and technological conditions. Targeted material types can be changed based on market availability.

Consequences on Waste Stream Composition

This program will reduce the volume of white goods, yard waste, and construction and demolition debris in the waste stream, leaving a greater amount of non-recyclable materials to be landfilled.

Ability to be Implemented

This program can be implemented at the landfill in less than six months, within the short term planning period.

Need for Facilities

This alternative uses existing facilities at the landfill. Some minor modifications of those facilities may be required.

Consistency with Local Policies, Plans, and Ordinances

This program does not conflict with local policies, plans, or ordinances.

Institutional Barriers to Implementation
There are no institutional barriers preventing implementation of this alternative.

Costs
This program would use equipment already available at the landfill; however, additional equipment may be necessary. The program may also require additional staff/management to sort and prepare recovered materials to market specifications.

According to the Yolo County SRRE, the estimated implementation costs for the self-haul bin transfer operation is approximately $280,000. Annual operations and maintenance cost is estimated to be $125,000. Funding for this program will be the County's Sanitation Enterprise Fund.

Market Availability
Markets are available for the materials recovered in this collection program. Specific buyers are provided in Appendix A. Additional markets may be available.

## Alternative 2. Concrete and Asphalt Recycling

Asphalt and concrete (A/C) generated from construction and demolition activities which is separated from other refuse at the point of generation can provide an effective means to diverting these materials from the waste stream. This source separation effort can be facilitated through City promotion efforts and landfill tipping fees set to encourage source separation. Source separated A/C can easily be diverted at YCCL for use as wet weather pads and road base materials as well as other road base uses in the region. The County will be exploring processing options for these materials in the short-term planning period.

Through this alternative the City could encourage source separation of inert wastes through program promotion and also assist in regional marketing efforts to divert these materials. The City could also work with the County, if only to lend support, in the development of a County ordinance mandating the source separation of inert wastes.

Effectiveness

As indicated in Table 7-3, this alternative may result in additional diversion of up to 1,658 TPY in the short-term planning period or approximately 2 percent of the total waste stream.

Table 7-3. Effectiveness of Concrete and Asphalt Recycling

| Waste Type | 1990 Tonnage Available (TPY) | Diversion Rate (%) | Amount Diverted (TPY) |
|---|---|---|---|
| Asphalt | 1,627.6 | 50 | 813.8 |
| Concrete | 1,688.9 | 50 | 844.4 |
| Total | 5,306.5 | --- | 1,658.2 |

Hazards

There are no identifiable hazards associated with this alternative.

Ability to Accommodate Change

This alternative is highly adaptable to changing market conditions.

Consequences on Waste Stream Composition

This alternative reduces the quantity of inert waste currently disposed.

Ability to be Implemented

This alternative would be implemented in within 4 to 8 months - the short-term planning period.

Need for Facilities

Implementation of this alternative at YCCL will require available space for the receipt of wastes and material processing operations. Construction and demolition contractors would require additional containers for the source separation of materials.

Consistency with Local Policies, Plans, and Ordinances

This type of program does not conflict with local policies, plans, and ordinances.

Institutional Barriers to Implementation

There are no institutional barriers to the implementation of this alternative.

Costs

Cost to the City of Woodland for this program would be limited to the development and distribution of public information materials to promoting the source separation of inert materials.

Market Availability

Recycled asphalt and concrete could be used by the County DPW as road base at the landfill or for public roadways. Additional markets could be facilitated by requiring a percentage of recovered inert wastes in City building and roadway construction specifications

## 7.4 SELECTION OF PROGRAMS

### 7.4.1 Programs Selected

In keeping with the City's policy to participate in regional County integrated waste management programs, the City has selected both alternatives described in this component. Participation in these programs allows the City to take full advantage of economies of scale in the development of regional processing facilities and to provide consistent waste management programs throughout the County. This regional integrated approach will result in a commonality in waste management practices and will benefit the entire County waste management system.

The following is a brief summary of selected programs.

Alternative 1. Self-Haul Bin Transfer Operations

The YCCL is currently in the process of developing a "self-haul bin transfer operation" recovering white goods, wood waste, yard waste and other materials which are in sufficient quantity to target for diversion. The operation is scheduled to commence operations in the 4th quarter of 1992. Through this alternative the City will promote the use of this facility and encourage residents of Woodland to divert white goods and other wastes not targeted through current diversion programs to this recovery operation.

Alternative 2. Concrete and Asphalt Recycling

Through this alternative the City will promote the source separation of inert wastes through public education efforts. Promotions may be in the form of brochures or in-person contact with construction/demolition companies doing work in the City of Woodland. The City will also support County efforts in the development of an ordinance to mandate source separation of inert and other wastes.

The City will also assist the County in regional market development efforts and will consider revising current City construction specifications requiring percentages of recovered A/C materials for new construction.

### 7.4.2 Summary of Anticipated Diversion Through Special Waste Programs

Tables 7-4 and 7-5 below summarize estimated diversion rates through programs selected in this component. These programs may result in of diversion rate of 4.4 percent in the short and

medium-term planning periods.

Table 7-4. Projected Amounts of Materials to be Diverted in the Short-Term Planning Period

| Waste Type | Total Generated (TPY) | Amount Diverted Through Selected Programs | | Total Diverted (TPY) |
|---|---|---|---|---|
| | | Estimated Self-Haul Diversion (TPY) | Estimated Diversion Through A/C Source Separation (TPY) | |
| White Goods | 82 | 82.0 | — | 82.0 |
| Mixed Yard Waste | 12,057 | 43.9 | — | 43.9 |
| Construction/Demolition | 3,255 | 2,587.9 | — | 2,587.9 |
| Asphalt | 1,502 | — | 745.5 | 745.5 |
| Concrete | 2,016 | — | 1,001.6 | 1,001.6 |
| Total Diversion | — | 2,714 | 1,747.1 | 4,460.9 |
| Percent Diversion | — | 2.7 | 1.7 | 4.4 |

Table 7-5. Projected Amounts of Materials to be Diverted in the Medium-Term Planning Period

| Waste Type | Total Generated (TPY) | Amount Diverted Through Selected Programs | | Total Diverted (TPY) |
|---|---|---|---|---|
| | | Estimated Self-Haul Diversion (TPY) | Estimated Diversion Through A/C Source Separation (TPY) | |
| White Goods | 98 | 98.0 | — | 98.0 |
| Mixed Yard Waste | 14,341 | 51.9 | — | 51.9 |
| Construction/Demolition | 3,872 | 3,059.4 | — | 3,059.4 |
| Asphalt | 1,787 | — | 1,322.3 | 1,322.3 |
| Concrete | 2,397 | — | 1,776.5 | 1,776.5 |
| Total Diversion | — | 3,209 | 3,098.8 | 6,308.1 |
| Percent Diversion | — | 2.7 | 2.6 | 5.4 |

## 7.5 PROGRAM IMPLEMENTATION

The following tables outline the implementation schedules for the alternatives selected by the City of Woodland. Projected costs, funding sources, and entities responsible for implementation are also summarized.

**Table 7-6. Program Implementation for the Self-Haul Bin Transfer Operation**

| Task | Responsible Entity | Start Date | Completion Date | Funding Source | Estimated Cost |
|---|---|---|---|---|---|
| Prepare engineering design and specifications | County DPW | 9/91 | 1/92 | CSEF* | $25,000 |
| Obtain required permits | County DPW | 9/91 | 3/92 | CSEF | $10,000 |
| Construct Facility | County DPW | 7/92 | 9/92 | CSEF | $245,000 |
| Retain Contractor for operations | County DPW | 9/92 | 9/92 | CSEF | $0 |
| Commence operations | Contractor/ County DPW | 10/92 | Ongoing | CSEF | $125,000 (annual) |
| Monitor program effectiveness | County DPW/Recycling Coordinator | 12/92 | Quarterly | CSEF | 20 hours annually |

* CSEF - County Sanitation Enterprise Fund.

Table 7-7. Implementation Schedule for Concrete and Asphalt Diversion

| Task | Responsible Entity | Start Date | Completion Date | Funding Source | Estimated Cost |
|---|---|---|---|---|---|
| Identify contractors in the City which generate asphalt and concrete (A/C) | Recycling Coordinator/ Franchised Waste Hauler | 9/92 | Ongoing | City Funds | 20 hours annually |
| Promote source separation of A/C at construction sites | Recycling Coordinator/ Franchised Waste Hauler | 9/92 | Ongoing | City Funds/ Rate Structure | 20 hours annually |
| Assist County efforts in A/C market development | Recycling Coordinator/ Franchise Waste Hauler | 6/92 | Ongoing | City Funds/ Rate Structure | N/A |
| City review of current construction specifications | City DPW | 12/92 | 6/93 | City Funds | N/A |
| Support revised tipping fees to encourage source separation | City DPW | 6/92 | 9/92 | City Funds | N/A |
| Monitor program effectiveness | Recycling Coordinator/ Franchised Waste Hauler | 12/93 | Quarterly, with annual update report | City Funds/ Rate Structure | 20 hours annually |

## 7.6 MONITORING AND EVALUATION

Summarized in this section are the methods to be utilized for monitoring and evaluating selected programs. Special waste programs will be individually monitored and evaluated relative to the targeted diversion goals as presented in Tables 7-4 and 7-5.

### 7.6.1 Methods to Monitor and Quantify Program Results

Alternative 1: Self-Haul Bin Transfer

Objective
The objectives will be to divert the amounts of materials as presented in Table 7-4 and 7-5 for construction and demolition debris, yard waste, and white goods.

Responsible Entity
The landfill operator (the County) will keep records and report diversion quarterly to the Recycling Coordinator.

Criteria/Methods of Evaluation
White goods will be individually counted and recorded by daily landfill gate tabulation. A specific fee is charged for these items. Construction and demolition debris will be directed to a special tipping area for separation and handling. Weights of materials will be recorded and compared against weigh tickets from recyclers.

Contingency Plan if Shortfall
Should diversion levels fall short, the City will verify the quantity of white goods, yard wastes, and other materials in the self-haul waste stream to assure that available materials are being diverted.

Alternative 2: Concrete and Asphalt Recycling

Objective
To divert 70 percent of the concrete and asphalt currently landfilled during the short-term and medium-term planning periods.

Responsible Entity
The waste hauler and the Recycling Coordinator will be responsible for the development and implementation of this program. The County will be responsible to maintain current diversion activities at the YCCL.

Criteria/Methods of Evaluation
Gate attendants at the landfill will monitor activity by checking and tabulating debris boxes full of concrete and asphalt when they arrive at the gate. The County DPW will also keep records

of inert materials re-used in road projects and at the landfill. These records will be tabulated on a cubic yard basis and reported to the Recycling Coordinator on a quarterly basis.

Contingency Plan if Shortfall

Should diversion levels fall short, the City will first investigate overall construction and road building activity in the City. Should the decrease be a direct result of a drop in building activity, then the goals for that year will be re-evaluated. If the decrease is a result of a lack of awareness or participation, levels of program promotion will be increased.

### 7.6.2 Funding

It is estimated that the primary expenditures for monitoring and evaluation will be additional time required by City Staff to evaluate and produce a summary report to the City Council annually. Total estimated man hours are estimated to not exceed 40 hours annually for the programs outlined above. The source of funding will be City funds.

## FOOTNOTES

1. Roy Wilson, Supervisor, City of Woodland Water Pollution Control Plant, 5/16/91, oral communication.
   City of Woodland AB 939 Sludge Generation Questionnaire, Sherri Martin, Administrative Assistant, Department of Public Works, 3/12/91.

2. Richard McHenry, Water Resources Control Engineer, Central Valley Regional Water Quality Control Board, 5/16/91, oral communication.

3. Richard McHenry, Water Resources Control Engineer, Central Valley Regional Water Quality Control Board, 5/16/91, oral communication.
   Dave Smith, Air Pollution Control Specialist, Yolo County Air Pollution Control District, 5/20/91, oral communication.

4. Roy Wilson, Supervisor, City of Woodland Water Pollution Control Plant, 5/16/91, oral communication.

5. Tom Mohr, Yolo County Department of Public Works, 5/28/91, oral communication.

6. Yolo County Solid Waste Management Plan, November, 1989, Sections 4.2.1 and 8.6.2.

7. Valley Tire Center, Inc., 5/20/91, oral communication.
   Bergen Tire Company, 5/20/91, oral communication.
   Bernard's Tire, Brake and Alignment, Inc., 5/20/91, oral communication.
   Big O Tire Stores, 5/21/91, oral communication.
   Carranza's Exxon, 5/20/91, oral communication.
   Dob's Tire and Auto Center, 5/21/91, oral communication.
   Goodyear Tire Center, 5/21/91, oral communication.
   Grand Auto, 5/20/91, oral communication.

8. Mindy Antonio, Anderson Convalescent Hospital, 5/15/91, oral communication.
   Nurse Powell, Countryside Intermediate Care Facility, 5/15/91, oral communication.
   Earl Keck, Hillhaven Convalescent Hospital, 5/15/91, oral communication.
   Carol Dahnke, Administrator, Stollwood Convalescent Hospital, 5/15/91, oral communication.
   Barbara Upton, Woodland Memorial Hospital, 5/16/91, oral communication.
   Donna Hess, Woodland Skilled Nursing Facility, 5/15/91, oral communication.
   Joyce Boughton, Yolo General Hospital, 5/15/91, oral communication.
   Angela Wilson, Safety Officer, Woodland Clinic Medical Group, 5/16/91, oral communication.

# SECTION 8

# EDUCATION AND PUBLIC INFORMATION COMPONENT

This section describes the various education and public information programs to be developed in support of the specific alternatives selected by the City of Woodland to meet its waste diversion goals. The success of this component is necessary if the City is to succeed in achieving the objectives of the other, more technical, alternatives. Through education and public information, all participants (individuals, households, businesses and institutions) will gain the knowledge, understanding and the desire to actively contribute in meeting the City of Woodland's environmental goals.

## 8.1 GOALS AND OBJECTIVES

Based upon data from the Waste Generation Study and in conjunction with the combined goals of the other components, the short-term goal of this component is to provide the education and public information support necessary to achieve an overall 25 percent diversion by 1995 and a 50 percent diversion by the year 2000. In order to accomplish this, the following objectives have been established.

- Develop education and information programs which will increase participation in the waste reduction and diversion targets presented in the source reduction, recycling, composting, and special wastes components of this plan.

- Create an awareness level of 60 percent by all Woodland residents regarding the City's recycling, composting and source reduction efforts by 1995 and a 90 percent awareness level by the year 2000.

- Develop and have in place materials on recycling, composting and source reduction in at least 50 percent of all local schools by 1995 and 100 percent by the year 2000.

- Work with the Yolo County Recycling Task Force to insure programs and materials are used cooperatively, efficiently and cost-effectively where possible.

- Establish with the Woodland Chamber of Commerce a commercial recyclers forum and a source reduction and recycling awards recognition program for local businesses.

- By 1993, create a centralized theme and recycling program identity.

Target Audiences

Based on data from the Waste Generation Study, targeted waste generators were selected for the design and development of the education and public information programs. Based on the type and quantity of waste generated, the following were selected:

- Single family residents
- Multi-family residents
- Commercial/Industrial generators
- Institutions

## 8.2 EXISTING CONDITIONS

The following provides a description of the existing education and public information programs and activities currently in place in the City of Woodland which promote source reduction, recycling, composting, and the safe handling and disposal of solid waste.

City Activities

At present, the Public Works Department develops information materials and brochures regarding current recycling programs.

Certified Recycling Center Promotion

Certified recycling redemption centers benefit from the promotion and media campaigns administered by the Division of Recycling - Department of Conservation. Local businesses promote the locations as part of the requirements of AB-2020. The high visibility of the recycling domes also serve as a constant reminder to the citizens of Woodland that recycling is available to them.

Non-Profit Buyback Promotion

The local buy-back center (the Sheltered Workshop) provides advertising and promotion on a limited basis. Primarily, the focus is to promote redemption prices.

Curbside Recycling Promotion

In conjunction with the recent implementation of the residential curbside program, an informational brochure (printed in English and Spanish) has been produced. In addition to explaining how to participate in the program, it also stresses the importance of recycling and the effects on the environment. A public open house was also held at the Sheltered Workshop in conjunction with the curbside kick-off. Developmentally disabled members of the workshop are involved in the sorting and processing of the collected recyclables.

Schools Promotion
Several Woodland schools conduct their own recycling programs. Education and information materials are developed and transmitted within each institution.

Business, Industry, Government Promotion
A number of Woodland businesses, offices, and institutions have developed effective in-house recycling programs. As in the schools, the education and information materials are produced by each organization regarding their specific program.

Media Promotion
Local media have been supportive of Woodland recycling activities drawing from support information provided by the City and sponsors of specific recycling events.

## 8.3 PROGRAM ALTERNATIVES

The following alternatives for the Woodland education and public information component were identified for three key purposes:

- To increase overall awareness regarding all source reduction, recycling, composting, and special waste handling efforts in the City of Woodland.
- Increase participation in source reduction, recycling, composting, and special wastes programs designated in this plan for implementation by the City.
- To develop specific programs targeted at critical generators.

Residential Sector Promotional Campaign

Instructional/information brochures will be developed stressing source reduction and recycling and other waste diversion programs taking place in the City. They will be given to every applicable residence explaining how to participate in the Woodland residential recycling programs. These brochures will also serve as handouts at presentations to service clubs and civic organizations prior to and after the recycling programs are operating.

Commercial/Industrial Programs

As part of the recycling component, the Recycling Coordinator will assist the contract refuse hauler in the design, development, and implementation of the specific business recycling programs. As individual programs are developed for businesses, the City will provide back-up support in the form of source reduction and recycling information materials and suggested implementation plans. The actual collection and processing of materials will be the

responsibility of the City's contract refuse hauler.

School Curriculum

In cooperation with Woodland Unified School District, the City will select and assist in the implementation of specific educational programs for all elementary grades (K-6). Although packaged programs are available from the CIWMB and other sources, it will be imperative that materials be adapted to focus on Woodland's specific recycling programs. The Recycling Coordinator and school district officials will seek a co-sponsor to participate with the City and/or School District by purchasing and/or offsetting some of the expenses associated with this program.

School Tours

In cooperation with Yolo County Department of Public Works and the City's contract refuse hauler, tours will be arranged to provide students the opportunity to visit the nearby Yolo County Landfill and Recycling Processing Facilities. Student understanding of the technical and operational aspects of the recycling and composting process is important, not only for their benefit, but to provide them with accurate information as they share their knowledge with parents and friends. Additional student tours can be set up with local businesses and institutions which have special recycling programs or process recycled materials.

Business Recognition Program

The City, in cooperation with the Woodland Chamber of Commerce or other business organizations, will establish recycling and source reduction recognition events. A full spectrum of awards can be presented to those firms establishing recycling and source reduction programs, with special acknowledgements going to major diversion efforts or other significant achievements.

Media Advertising & Releases

On a regular basis, the City will purchase advertising space in the Daily Democrat to show the progress and success of the various recycling and source reduction programs. The "thermometer" type of ads provide an ongoing indication of a program's achievement, while maintaining the peer pressure awareness so important in obtaining citizen participation. A quarterly update report on waste diversion activities will be made available to local newspapers to increase awareness of recycling programs and the cities' progress towards meeting diversion goals.

In addition to the paid advertising campaign, the City will produce and transmit appropriate releases to all media throughout the Woodland area regarding the various aspects of the recycling and source reduction programs. These releases will be targeted towards new programs and to

serve as reminders on how to participate in ongoing waste diversion alternatives - particularly if diversion or participation levels are falling short.

Community Events

The City, will take part in promoting recycling at community events and other local activities such as the County Fair and Cruise Night. In most cases, promotional information will be offered to attendees.

## 8.4 PROGRAM SELECTION

All alternatives described in Section 8.3 are selected for implementation.

## 8.5 PROGRAM IMPLEMENTATION

Tables 8-1 through 8-8 list the program implementation schedules.

### 8.5.1 Collateral Materials (for the Source Reduction and Residential Sector Promotional Campaign Programs)

The Recycling Coordinator will work with the staff of the contract refuse hauler to develop program support materials for source reduction and recycling directed towards the curbside, multi-family, and commercial/industrial sectors.

Table 8-1. Implementation Schedule for Development of Collateral Materials

| Task | Responsible Entity | Start Date | End Date | Funding Source | Cost |
|---|---|---|---|---|---|
| Develop curbside promotional materials | Recycling Coordinator/ Franchised Waste Hauler | 1/94 | 3/94 | Rate Structure | $1,800 |
| Develop and advertise backyard composting programs | Recycling Coordinator | 2/93 | 3/93- ongoing | Rate Structure | $2,500/ 40 hours |
| Develop and distribute general source reduction and recycling fact sheets | Recycling Coordinator | 6/92 | ongoing, annually | Rate Structure | $8,000/ 80 hours |
| Monitor and evaluate | Recycling Coordinator | 12/92 | ongoing, annually | City Funds | Staff Time - 25 hours |

### 8.5.2 Commercial/Industrial Programs

The Recycling Coordinator will work with the franchised waste hauler to develop and distribute information relating to recycling, composting and source reduction alternatives to businesses operating in Woodland.

Table 8-2. Implementation Schedule for Commercial/Industrial Business Programs

| Task | Responsible Entity | Start Date | End Date | Funding Source | Cost |
|---|---|---|---|---|---|
| Develop outreach materials for source reduction and recycling | Recycling Coordinator/ Franchised Waste Hauler | 9/92 | Ongoing | Rate Structure | $2,500/ 40 hours |
| Deliver materials to relevant businesses and organizations | Recycling Coordinator/ Franchised Waste Hauler | 12/92 | Ongoing | Rate Structure | Staff Time 80 hours |
| Monitor and evaluate | Recycling Coordinator | 12/92 | Ongoing, annually | City Funds/Rate Structure | Staff Time 20 hours |
| Average Annual Short-Term cost | --- | --- | --- | --- | $2,500/ 140 hours |

### 8.5.3 School Programs

The Recycling Coordinator will work with representatives from the Woodland School District to develop a program and curriculum for students. The Recycling Coordinator will seek grant funding from local businesses including the contract refuse hauler. In addition, the Recycling Coordinator will develop a tour program for students to visit local waste handling facilities.

**Table 8-3. Implementation of School Curriculum Introduction**

| Task | Responsible Entity | Start Date | End Date | Funding Source | Cost |
|---|---|---|---|---|---|
| Meet with schools to develop needs list | Recycling Coordinator/ School Staff | 6/92 | 9/92 | City Funds | Staff Time 80 hours |
| Research & purchase curriculum | Recycling Coordinator/ School Staff/Private Donors | 1/93 | 7/93 | Rate Structure/ Schools/ Private Donors | $10,000/ 40 hours |
| Provide school presentations | Recycling Coordinator | 9/93 | Ongoing | City Funds | Staff Time 80 hours |
| Provide curriculum updates | Recycling Coordinator | 1/95 | 3/95 | Rate Structure/ School District/ Private Donors | $5,000 |
| Develop school tour programs | Recycling Coordinator/ School Staff/Facility Operators | 5/93 | Ongoing | School District | $1,000 annually, Staff Time 20 hours |
| Monitor and evaluate | Recycling Coordinator/ School Staff | 6/94 | Ongoing, annually | School District | Staff Time 10 hours |

one time - staff 3360 + 15,000 = 18,360

annual - staff 3080 + 1,000 = 4,080

### 8.5.4 Media Programs

The Recycling Coordinator will coordinate all media advertising programs in Woodland. In addition, the Recycling Coordinator will oversee all media releases relating to specific programs. This will include a brief quarterly waste diversion update.

Table 8-4. Implementation Schedule for Media Advertising and Releases

| Task | Responsible Entity | Start Date | End Date | Funding Source | Cost |
|---|---|---|---|---|---|
| Develop and evaluate relevant media | Recycling Coordinator | 6/92 | 8/92 | City Funds | Staff Time 40 hours |
| Develop advertising material | Recycling Coordinator | 9/92 | 11/92 | City Funds | Staff Time 40 hours |
| Purchase and schedule advertising | Recycling Coordinator | 11/92 | ongoing | Rate Structure | $10,000/yr |
| Develop and present quarterly waste diversion updates | Recycling Coordinator | 12/92 | ongoing, quarterly | City Funds | Staff Time 40 hours |
| Develop and present specific program updates | Recycling Coordinator/ Franchised Waste Hauler | 6/92 | ongoing, as needed | Rate Structure | Staff Time 40 hours |
| Monitor and evaluate | Recycling Coordinator | 12/92 | ongoing, annually | City Funds | Staff Time 10 hours |
| Average annual short-term cost | — | — | — | — | $10,000/ 170 hours |

### 8.5.5 Community Events

The Recycling Coordinator will oversee the City's involvement in appropriate community events such as Cruise Night and the County Fair.

Table 8-5. Implementation Schedule of Community Events

| Task | Responsible Entity | Start Date | End Date | Funding Source | Cost |
|---|---|---|---|---|---|
| Develop public presentation | Recycling Coordinator | 7/92 | Ongoing | City Funds/ Rate Structure | $1,000 |
| Participate in local events | Recycling Coordinator | 9/92 | Ongoing, as necessary | City Funds | Staff Time 100 hours |
| Monitor and evaluate program | Recycling Coordinator | 12/92 | Ongoing, annually | City Funds | Staff Time 10 hours |
| Average annual short-term cost | --- | --- | --- | --- | $1,000 110 hours |

## 8.6 MONITORING AND EVALUATION

The Recycling Coordinator from the City of Woodland will be responsible for the monitoring and evaluation of all programs associated with achieving its desired diversion goals. An annual survey will be conducted and the results presented to the City Council each December as part of the regular reporting.

In particular, the attainment of the education and public information objectives will be addressed in two basic methods:

- Surveys to assess the awareness level of the community regarding the various recycling and source reduction programs within the City of Woodland.
- The gathering of specific data to determine the effectiveness of selected alternatives to meet their objectives.

Telephone sample surveys will be conducted annually by the Recycling Coordinator to determine the awareness level of Woodland citizens regarding community recycling and source reduction

activities. When the selected alternatives are in place, the surveys will attempt to relate citizen awareness to actual participation in the programs. It is important for the City to have a true picture of the relationship between simple awareness and actual participation. For example, the random telephone sampling will indicate awareness as follows:

| Awareness | Effectiveness |
|---|---|
| 0 percent - 25 percent | Not effective |
| 26 percent - 50 percent | Somewhat effective |
| 51 percent - 75 percent | Effective |
| 76 percent - 100 percent | Very effective |

Similarly, data gathered from actual citizen participation information should signify certain relationships between the programs and citizen awareness. As a guide, participation will be evaluated as follows:

| Awareness | Effectiveness |
|---|---|
| 0 percent - 25 percent | Not effective |
| 26 percent - 50 percent | Somewhat effective |
| 51 percent - 75 percent | Effective |
| 76 percent - 100 percent | Very effective |

It is important to assess the relationship between the two areas of awareness and participation.

- A high awareness and low participation would indicate a weakness in the operational structure of a program.
- Low awareness and low participation indicates an ineffective education and/or informational program.

The following monitoring plans will be utilized on an annual basis to audit each of the specific education and public information programs in order to determine their effectiveness in achieving desired goals:

Backyard Composting Program

- Number of households participating
- Number of new participants in program
- Level of complaints regarding odors (indicating proper composting techniques)

Residential Sector Programs

- Overall participation in programs
- Amount of non-targeted materials rejected at the processing facilities
- Overall awareness of waste diversion opportunities as a result of surveys
- Level of activity at buy-backs

Commercial/Industrial Programs

- Name and number of commercial/industrial recycling programs established.
- Specific diversion data (from hauler) of construction demolition debris programs.
- Awards presented (results of achievements)
- Plans for ongoing continuity
- Number of businesses nominated
- Number of businesses eligible for consideration

School Curriculum & Tours

- Name and number of schools utilizing materials
- Number of classes within each school (Grade Levels)
- Number of students in each class
- Total number of students exposed to program
- Total number of students taking field trips

Business Recycling Source Reduction Recognition Award Program

- Name and number of commercial/industrial recycling programs established.
- Specific diversion data (from hauler) of construction demolition debris programs.
- Details of event; who what, where, when, how
- Awards presented (results of achievements)
- Plans for ongoing continuity
- Number of businesses nominated
- Number of businesses eligible for consideration

Media Programs

- Number of newspaper articles published annually
- Number of TV ads on the local Public Access Channel
- Billboard advertising

Community Events

- Overall interest and awareness of individuals
- Number of enquiries regarding recycling programs
- Number of Woodland residents at the events

### 8.6.1 Contingency Measures

Should the monitoring of diversion objectives indicate a shortfall, the following measures will be implemented.

Source Reduction Programs
Determine which sector(s) is experiencing shortfalls. Determine reason. Direct added attention to that sector through education programs.

Backyard Composting Program
Determine how to increase awareness of program. Increase advertising. Contact current composters to see if new participants can be attracted.

Residential Sector Programs
Increase education programs to increase awareness and participation.

Commercial/Industrial Programs
As part of the City's overall diversion goals and objectives Commercial/Industrial Recycling is a major factor. Should the efforts of this component fall short, a variety of plans will take effect.

- Organization of a volunteer group of business leaders will be sought to work directly with the City to develop and expand programs.
- Evaluation of rate structures to encourage recycling.
- Evaluation of business licensing and fee structures.
- Ongoing advertising campaign to recognize leading business recycling programs.

School Curriculum & Tours
Through informal surveys and from data provided by the California Division of Recycling, it appears there is high level of interest by schools wanting materials for classroom use. Should the City's objectives fall short, meetings will be set with teachers and school administrators to evaluate and redesign the program and/or materials in order to reach desired objectives.

If desired objectives for school tours fall short, meetings will be set with school teachers and administrators to determine reasons why site tours are not meeting objectives. If transportation costs become a factor, the City will seek funding from available resources or possibly

business/community support.

Awards Program
Should the awareness and recognition levels for the awards program fall short, the Recycling Coordinator will adopt the following measures:

- Increase advertising and awareness of awards program
- Seek increased participation from other civic groups
- Seek other venues which will increase awareness of program

Media Programs
The City will investigate the effectiveness of media programs and determine how they may be made more effective. In addition, alternate forms of the media will be investigated for utilization by the City to increase overall awareness.

Community Events
Should overall awareness and participation in waste diversion programs not be attained, the Recycling Coordinator will seek other venues to present waste diversion information.

### 8.6.2 Funding for Monitoring & Evaluation

Monitoring and evaluation of education programs will be performed by the Recycling Coordinator. Activities will primarily revolve around utilizing staff time to conduct telephone surveys and to develop an annual report of effectiveness for the City Council each December. Funding for the monitoring and evaluation of education programs will come primarily from the City Funds.

# SECTION 9

# FACILITY CAPACITY COMPONENT

The Facility Capacity Component describes the waste disposal facilities utilized by the City of Woodland, projects the future waste capacity needs of the City, and identifies what Yolo County will do to meet future capacity demands. In addition, a description of solid waste facilities that will be closed, expanded, or established in the 15-year planning period is included. At the outset of this component it is important to note that there are no waste disposal facilities within the City; all waste is exported to the County landfill located in the Unincorporated Area of the County.

## 9.1 EXISTING CONDITIONS OF DISPOSAL FACILITIES USED BY THE CITY OF WOODLAND

One-hundred percent of the waste disposed of by the City is sent to the Yolo County Central Landfill (YCCL) located off County Road 28H, near the intersection with County Road 104. The landfill is owned and operated by the Yolo County Department of Public Works and Transportation. Daily refuse placement and cover is provided by Earthco through a contract with the County. The quantities and types of waste disposed of at the landfill from the City of Woodland are given in Table 9-1.

The disposal fees at the landfill, effective July 1, 1991, are as follows:

| | |
|---|---|
| Commercial loads | $17.75 per ton |
| Commercial loads (imported) | $21.25 per ton |
| Noncommercial autos | $ 2.00 each |
| Noncommercial pickups and small trailers (8 feet or less) | $ 4.00 each |
| Noncommercial small trailers or pickups (8 feet or less) with loads greater than three feet above the bed | $ 6.00 each |
| Bulky wastes | $63.75 per ton |
| Auto tires | $ 2.00 each |
| Truck tires (16 to 22 inch) | $ 3.00 |
| Tractor tires (24 inch and larger) | $ 4.00 |
| Bulk tires | |
| (whole) | $78.00 per ton |
| (split) | $53.00 per ton |
| (Shredded) | $28.00 per ton |
| Household appliances | $ 3.00 each |
| Clean soil, unmixed concrete or asphalt chunks two feet or less in greatest dimension | $ 0 |

| | |
|---|---|
| Mixtures with soil, gravel, and asphalt or large chunks of concrete or asphalt | $ 9.00 per ton |
| Septic, cannery, and similar liquid wastes | $34.00 per ton |
| Truck wash-out | $50.00 each |
| Minimum cash fee for weighed materials | $ 7.00 |
| Separated recoverable materials | $ 0 |

The landfill hours of operation are:

| | |
|---|---|
| Monday thru Saturday | 6:00 am to 5:00 pm |
| Sunday | 7:00 am to 6:00 pm |

The facility is open to the public from 6:30 am to 4:00 pm Monday through Saturday and 9:00 am to 5:00 pm on Sundays. The facility is closed on New Years Day, Easter Sunday, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day.

The landfill had a remaining capacity of 11,250,000 tons of waste as of January, 1991 and is expected to reach 100 percent capacity in 2025 with no reduction in the future waste stream. The Recycling, Composting, Source Reduction, and other programs that will be enacted to meet the goals of AB 939 will lengthen the expected life of the facility.

The landfill is located on a 722.37 acre parcel of which 640 acres are permitted by the California Integrated Waste Management Board (CIWMB) under Solid Waste Facility Permit 57-AA-001. Under the existing permit, the facility is allowed to receive 1,500 tons per day of refuse for 360 days per year. The landfill currently receives approximately 750 tons per day of refuse of which approximately 35 percent is imported from Sacramento County.

# Table 9-1. Types and Quantities of Materials Disposed of by the City of Woodland - 1990[1]

| WASTE CATEGORY | RESIDENTIAL (TPY) | COMMERCIAL (TPY) | INDUSTRIAL (TPY) | SELF-HAUL (TPY) | OTHER WASTE (TPY) | 1990 TOTAL TONS |
|---|---|---|---|---|---|---|
| Newspaper | 872 | 430 | 64 | 0 | 0 | 1,367 |
| Corrugated | 612 | 4,270 | 1,153 | 0 | 0 | 6,035 |
| Highgrade paper | 165 | 1,311 | 52 | 0 | 0 | 1,528 |
| Mixed waste paper | 1,455 | 1,866 | 274 | 0 | 0 | 3,595 |
| Contaminated paper | 1,478 | 2,208 | 583 | 0 | 0 | 4,269 |
| PET | 57 | 11 | 0 | 0 | 0 | 68 |
| HDPE | 99 | 45 | 3 | 0 | 0 | 146 |
| Pigmented HDPE | 116 | 274 | 29 | 0 | 0 | 419 |
| PS | 88 | 102 | 10 | 0 | 0 | 200 |
| Film | 389 | 837 | 293 | 0 | 0 | 1,519 |
| Other plastic | 574 | 1,682 | 684 | 0 | 0 | 2,941 |
| CA redemption | 365 | 259 | 14 | 0 | 0 | 638 |
| Other recyclable glass | 691 | 54 | 7 | 0 | 0 | 752 |
| Non-recyclable | 5 | 5 | 10 | 0 | 0 | 21 |
| Aluminum cans | 36 | 92 | 11 | 0 | 0 | 138 |
| Bi-metal/tin | 449 | 152 | 12 | 0 | 0 | 613 |
| Ferrous metal | 174 | 1,037 | 678 | 0 | 0 | 1,869 |
| Non-ferrous metal | 74 | 232 | 642 | 0 | 0 | 948 |
| White goods | 0 | 0 | 0 | 68 | 0 | 66 |
| Grass/leaves | 1 | 1,322 | 0 | 0 | 0 | 1,324 |
| Prunings | 774 | 1,280 | 0 | 0 | 0 | 2,054 |
| Mixed yard waste | 0 | 0 | 0 | 46 | 9,993 | 10,039 |
| Food | 2,241 | 999 | 113 | 0 | 0 | 3,353 |
| Tires | 49 | 0 | 53 | 0 | 0 | 102 |
| Rubber | 45 | 40 | 90 | 0 | 0 | 175 |
| Wood waste | 102 | 2,718 | 1,208 | 0 | 0 | 4,028 |
| Wood (press board, etc) | 42 | 900 | 613 | 0 | 0 | 1,558 |
| Ag crop residue | 32 | 1,333 | 61 | 0 | 0 | 1,426 |
| Manure | 101 | 0 | 0 | 0 | 0 | 101 |
| Disposable diapers | 935 | 285 | 0 | 0 | 0 | 1,220 |
| Textiles, leather | 559 | 392 | 71 | 0 | 0 | 1,021 |
| Asphalt | 0 | 1,207 | 44 | 0 | 0 | 1,251 |
| Concrete | 0 | 1,653 | 25 | 0 | 0 | 1,678 |
| Inert solids | 604 | 2,757 | 586 | 0 | 0 | 3,947 |
| Composite materials | 322 | 494 | 167 | 0 | 0 | 983 |
| HHW material/containers | 77 | 37 | 4 | 0 | 0 | 119 |
| Misc. | 678 | 455 | 23 | 1,651 | 0 | 2,807 |
| Ash | 23 | 0 | 0 | 0 | 0 | 23 |
| Medical waste | 6 | 9 | 0 | 0 | 0 | 16 |
| C & D | 0 | 0 | 0 | 2,710 | | |
| Bulky waste | 0 | 0 | 0 | 80 | 0 | 80 |
| Other special | 5 | 0 | 0 | 0 | 0 | 5 |
| TOTAL | 14,294 | 30,750 | 7,577 | 4,555 | 9,993 | 67,169 |

[1] Totals not exact due to rounding

## 9.2 ADDITIONAL CAPACITY REQUIREMENTS

Additional capacity requirements for a 15-year planning period are calculated using the following formula from the CIWMB planning guidelines and procedures for preparing, revising, and amending county-wide integrated waste management plans:

$$AC_n = [(G+I) - (D+TC+LF+E)]_n$$

where:

AC = Additional capacity required in year n.

G = The amount of solid waste projected to be generated in the jurisdiction (from Waste Generation Study).

I = The amount of solid waste expected to be imported to the jurisdiction for disposal in permitted solid waste disposal facilities through interjurisdictional agreement(s) with other cities or counties, or through agreements with solid waste enterprises, as defined in Section 40193 of the Public Resources Code.

D = The amount diverted through successful implementation of proposed source reduction, recycling, and composting programs (from the Waste Generation Study and the Integration Component).

TC = The amount of volume reduction occurring through available, permitted transformation facilities.

LF = The amount of permitted solid waste disposal capacity which is available for disposal in the jurisdiction.

E = The amount of solid waste generated in the jurisdiction which is exported to solid waste disposal facilities through interjurisdictional agreement(s) with other cities or counties, or through agreements with solid waste enterprises, as defined in Section 40193 of the Public Resources Code.

n = Each year of a 15-year period commencing in 1991 (iterative in one-year increments).

The results of these calculations are shown in Table 9-2.

Table 9-2. Additional Capacity and Waste Generation for the City of Woodland

| Year | AC (yd)[2] | AC (TPY) | G[3] (TPY) | I (TPY) | D (%) | D[4] (TPY) | TC (TPY) | LF (TPY) | E (TPY) |
|---|---|---|---|---|---|---|---|---|---|
| 1990 | 140,010 | 67,205 | 84,557 | 0 | 20.5 | 17,352 | 0 | 0 | 0 |
| 1991 | 145,288 | 69,738 | 87,715 | 0 | 20.5 | 17,977 | 0 | 0 | 0 |
| 1992 | 119,648 | 57,431 | 90,987 | 0 | 36.9 | 33,556 | 0 | 0 | 0 |
| 1993 | 118,817 | 57,032 | 94,385 | 0 | 39.6 | 37,353 | 0 | 0 | 0 |
| 1994 | 118,196 | 56,734 | 97,907 | 0 | 42.1 | 41,173 | 0 | 0 | 0 |
| 1995 | 118,490 | 56,875 | 101,564 | 0 | 44.0 | 44,689 | 0 | 0 | 0 |
| 1996 | 118,656 | 56,955 | 105,148 | 0 | 45.8 | 48,193 | 0 | 0 | 0 |
| 1997 | 112,069 | 53,793 | 108,859 | 0 | 50.6 | 55,066 | 0 | 0 | 0 |
| 1998 | 106,567 | 51,152 | 112,701 | 0 | 54.6 | 61,549 | 0 | 0 | 0 |
| 1999 | 100,588 | 48,282 | 116,680 | 0 | 58.6 | 68,398 | 0 | 0 | 0 |
| 2000 | 96,475 | 46,308 | 120,800 | 0 | 61.7 | 74,492 | 0 | 0 | 0 |
| 2001 | 100,069 | 48,033 | 125,065 | 0 | 61.6 | 77,032 | 0 | 0 | 0 |
| 2002 | 103,794 | 49,821 | 129,479 | 0 | 61.5 | 79,658 | 0 | 0 | 0 |
| 2003 | 107,654 | 51,674 | 134,048 | 0 | 61.5 | 82,374 | 0 | 0 | 0 |
| 2004 | 111,663 | 53,598 | 138,781 | 0 | 61.4 | 85,183 | 0 | 0 | 0 |
| 2005 | 115,819 | 55,593 | 143,681 | 0 | 61.3 | 88,088 | 0 | 0 | 0 |
| Total | 1,833,803 | 880,224 | 1,792,357 | 0 | | 912,133 | 0 | 0 | 0 |

Note: Heading abbreviations are defined on page 9-4.

The above table indicates that the City of Woodland will need additional landfill capacity during each of the next 15 years. This is misleading for two reasons. First, the YCCL is not located in an unincorporated area of Yolo County and waste disposed of there cannot be counted under the "LF" column as available local capacity. Second, the waste from Woodland that is taken to YCCL cannot be counted under the export column ("E") because the CIWMB will not allow waste that is exported for disposal to be shown as such unless the exporting jurisdiction has an official export agreement with the jurisdiction in which the disposal facility exists.

## 9.3 PLANS FOR FACILITY EXPANSIONS AND NEW SOLID WASTE FACILITIES

A wood processing facility is located adjacent to the YCCL. This facility is proposed to expand to wood and green waste processing. The wood waste will be processed into fuel, mulch, and humus. The green waste will be processed into compost, possibly for use as an alternate daily cover at the landfill.

In addition to the above, anaerobic composting in a landfill cell has been proposed to generate methane and for volume reduction of the waste.

No new or expanded facilities are proposed within the jurisdiction of Woodland.

## FOOTNOTES

1. EBA WASTECHNOLOGIES, 1991, Yolo County - AB939 Waste Generation Study

2. In-place volume calculation based on in-place density estimate of 1200 pounds per cubic yard and cover ratio of 4:1.

3. See Footnote #1.

4. Ibid.

# SECTION 10

# FUNDING COMPONENT

This Source Reduction and Recycling Element describes the programs that the City of Woodland will implement to meet the required diversion goals as mandated by AB 939. In order to accomplish the City's goals and objectives, sufficient funding must be available for program planning and development. This section describes the current funding sources, provides cost estimates and City staffing requirements for the planning, development, implementation, and monitoring and evaluation of selected programs, and identifies primary and contingency funding sources for the City.

## 10.1 CURRENT FUNDING SOURCES

The City of Woodland has an exclusive long-term franchise agreement with Waste Management of Woodland (WMW) for the collection and removal of all municipal solid waste generated from sources within the City. Refuse collection services also include the separate collection of residential yard waste at curbside, street sweeping, and other collection services in the City. These services are funded through refuse service fees which are adjusted annually based on the annual percentage increases in the Consumer Price Index (CPI). In the event that increases in landfill disposal fees exceed the CPI, service rates are adjusted by service category based on corresponding waste volume criteria for the incremental disposal cost difference.

Recycling services provide by WMW include residential curbside and commercial collection programs. The residential curbside collection program is currently funded through a monthly fee of $0.94 per household which is subject to an annual adjustment based on the CPI. An additional recycling activity fee of $0.70 per household and $0.25 per cubic yard are assessed to residential and commercial accounts respectively to fund public education, coordination, and other miscellaneous costs associated with the City's recycling programs.

## 10.2 ESTIMATED PROGRAM COSTS

The City's integrated waste management plan will be funded through "recycling activity" fees, refuse collection rates, and landfill tipping fees. Program implementation costs for the City are expected to result from staffing and coordination efforts by City personnel, a feasibility study to evaluate the implementation of a variable refuse collection rate structure, and expenditures for public information and education materials. These expenses will be funded through the City's recycling activities fees and are summarized in Table 10-1. Assuming that approximately $60,000 is available annually for program implementation, a shortfall in available funding is indicated in Table 10-1 for years 1993 and 1995. Program fees will be adjusted accordingly to account for these expenses.

Table 10-1. Estimates of City Funding Requirements

| Program | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|
| Variable Rate Evaluation | --- | --- | $30,000 | --- | $21,000* |
| Backyard Composting | --- | $7,500 | --- | $7,500 | --- |
| Education and Public Information | --- | $21,000 | $24,500 | $24,300 | $17,000 |
| City Staffing Requirements | --- | $19,000 | $43,000 | $30,000 | $29,000 |
| Total | --- | $47,500 | $105,000 | $61,800 | $67,000 |

* This cost is contingent on the City's decision to implement a variable refuse collection rate structure.

Expansion and development of commercial material recovery programs in the City will require funding for capital expenditures and operations and maintenance costs which will be the responsibility of the franchised waste hauler. These programs will be funded through increased commercial refuse service fees which will be adjusted accordingly.

Development of regional processing facilities will be funded by the Yolo County Department of Public Works and Transportation through the County Sanitation Enterprise Fund (CSEF). County refuse disposal fees will be adjusted accordingly to increase revenues to the fund. The County will also consider bond issuance as a means of financing recovery facilities should there be a shortfall in funds.

Table 10-2 summarizes City staffing requirements for program implementation and monitoring. Table 10-3 summarizes program capital expenditures and operations and maintenance costs for the selected programs.

Table 10-2. Projected City Labor Requirements (hours) to Meet the Program Implementation Goals

| Program | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|
| **Source Reduction** | | | | | |
| Determine Existing Conditions | — | — | 120 | 40 | 40 |
| Variable Rate Evaluation | — | — | — | — | — |
| Backyard Composting | — | — | 208 - 248 | 128 | 128 |
| Awards and Recognition Program | — | — | 66 | 46 | 46 |
| Non-Procurement Program | — | — | 80 - 120 | 50 | 50 |
| City Procurement Guidelines | — | — | 220 - 240 | 20 - 40 | 20 - 40 |
| Total Source Reduction | — | — | 694 - 794 | 284 - 304 | 284 - 304 |
| **Recycling** | | | | | |
| Commercial/Industrial Recycling Expansion | — | 320 | 780 | 780 | 780 |
| Commercial/Industrial Waste Diversion Through County MRF | — | — | — | — | — |
| Total Recycling | — | 320 | 780 | 780 | 780 |
| **Composting** | | | | | |
| Residential Yard Waste Collection (1) | — | — | — | — | — |
| Commercial/Industrial Yard Waste Collection | — | 120 | 140 | 40 | 40 |
| Total Composting | — | 120 | 140 | 40 | 40 |
| **Special Waste** | | | | | |
| Self-Haul Bin Transfer | — | — | — | — | — |
| Concrete/Asphalt Recycling | — | 60 | 180 | 60 | 60 |
| Total Special Waste | — | 60 | 180 | 60 | 60 |
| **Education** | | | | | |
| Collateral Material Development | — | 145 | 145 | 145 | 145 |
| Commercial/Industrial Business Program | — | 120 | 80 | 80 | 80 |
| School Curriculum | — | 80 | 140 | 20 | 20 |
| Media Advertising/Releases | — | 170 | 170 | 170 | 170 |
| Community Events | — | 110 | 110 | 110 | 110 |
| Total Education | — | 525 | 645 | 525 | 525 |
| Total City Staffing Requirements | — | 1,125 | 2,439 - 2,539 | 1,689 | 1,689 - 1,709 |

(1) Implementation of the County MRF facility is expected to take place in the medium-term planning period.

(2) The current residential yard waste collection program is not expected to require any addition revenue or staffing to continue the program as is.

Table 10-3. Projected Funding Requirements to Meet Program Implementation Goals

| Program | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|
| **Source Reduction** | | | | | |
| Determine Existing Conditions | — | — | — | — | — |
| Variable Rate Evaluation | — | — | $30,000 | — | $21,500 |
| Backyard Composting | — | $7,500 | — | $7,500 | — |
| Awards and Recognition Program | — | — | — | — | — |
| Non-Procurement Program | — | — | — | — | — |
| City Procurement Guidelines | — | — | — | — | — |
| **Total Source Reduction (1)** | — | $7,500 | $30,000 | $7,500 | $21,500 |
| **Recycling** | | | | | |
| Commercial/Industrial Recycling Expansion | — | — | — | — | — |
| Commercial/Industrial Waste Diversion Through County MRF | — | — | — | — | — |
| **Total Recycling** | — | — | — | — | — |
| **Composting** | | | | | |
| Residential Yard Waste Collection | — | — | — | — | — |
| Commercial/Industrial Yard Waste Collection (2) | — | — | $30,000 | $64,000 | $184,000 |
| **Total Composting (2)** | — | — | $30,000 | $64,000 | $184,000 |
| **Special Waste** | | | | | |
| Self-Haul Bin Transfer (3) | — | $245,000 | $125,000 | $125,000 | $125,000 |
| Concrete/Asphalt Recycling | — | — | — | — | — |
| **Total Special Waste (3)** | — | $245,000 | $125,000 | $125,000 | $125,000 |
| **Education** | | | | | |
| Collateral Material Development | — | $8,000 | $2,500 | $9,800 | — |
| Commercial/Industrial Business Program | — | $2,500 | — | $2,500 | — |
| School Curriculum | — | — | $11,000 | $1,000 | $6,000 |
| Media Advertising/Releases | — | $10,000 | $10,000 | $10,000 | $10,000 |
| Community Events | — | $1,000 | $1,000 | $1,000 | $1,000 |
| **Total Education (1)** | — | $21,500 | $24,500 | $24,300 | $17,000 |
| **Total Funding Requirements** | — | $274,000 | $209,500 | $220,800 | $347,500 |

(1) Programs to be funded through the City's "recycling activities" fees.
(2) Funding is provided through commercial refuse collection fees.
(3) Costs associated with the development of the Self-Haul Bin Transfer Facility will be funded through YCCL tipping fees.

## 10.3 CONTINGENCY FUNDING

In the event that the City's recycling fees fall short in funding selected programs, the City may consider the following contingency funding alternatives.

### 10.3.1 Tax Exempt Financing

General Obligation Bonds

These types of bonds can be used for any type of local government related projects and are secured by the local government issuer. These bonds are considered to offer the greatest security and lowest interest rates of tax-exempt securities. Bond payments to investors would be made directly from the general fund. The City would repay this debt by levying taxes or through refuse collection fees. These bonds tend to have a low interest rate but are more difficult to issue since they are limited to 3.75 percent of the City's net value and must have two-thirds voter approval prior to issuance.

Revenue Bonds

Revenue bonds are limited security financing instruments which tie bond payments to the revenue generated through the operations of the project which they finance. Solid waste and recycling projects are eligible for such financing.

Revenue Bonds have been used in California (and elsewhere) for many years to finance a variety of revenue-producing public facilities. Most commonly these bonds are issued under the provision of the Revenue Bond Law of 1941, commencing with Section 54300 of the California Government Code. Under this Act, the issuance of the bonds must be authorized by a simple majority of those voting at an election on the question of incurring the indebtedness. The bonds are secured solely by the pledged revenues derived from the facilities financed with bond proceeds or from an entire "enterprise" of which such facilities comprise an integral component (such as the tipping fees derived from landfill operations).

The limited security for revenue bonds (i.e., pledged revenues), and their marketability depends on a demonstrated revenue stream sufficient to cover debt service by 1.10 to 1.35 times available for debt service coverage, after payment of maintenance and operation costs (exclusive of depreciation). Also, a debt service reserve equal to the lesser of 10 percent of the par amount of the issue or maximum annual debt service is usually funded from bond proceeds. In addition, interest on the revenue bonds during construction and development of the facilities may be funded from their proceeds. If a project is to be financed in phases through the issuance of a series of revenue bonds, it is necessary to demonstrate that net revenues from historical operations and projected operations (discounted in the later instance) will cover debt service on the outstanding and proposed revenue bonds by a least the coverage factor (the "earnings test").

For a completely new start-up enterprise it is difficult, if not impossible, to market an issue of revenue bonds without an historical revenue experience. This may be overcome in one or both of two principal ways:

(1) If two or more public agencies presently operate similar facilities that are to be combined under a joint exercise of powers agreement, historical net revenues from the respective facilities may, if a binding revenue pledge can be effected, be used to demonstrate coverage. As an example, the revenue history of a closing landfill would thus be utilized to substantiate the projected revenues from a new landfill serving the same or expanded geographic radius.

(2) If jurisdictionally, politically, and financially feasible, one or more public agencies may issue Certificates of Participation (COPS) that are primarily general fund obligations supplementally supported by net revenues of the facilities. To the extent that net revenues do not cover debt service on the COPS, a general fund appropriation would be required. This approach eliminates the public voting requirement for revenue bonds, the coverage factor, and the earnings test for issuance of additional parity obligations. It is possible to issue revenue-secured COPS, but only the revenue bond public vote requirement can be avoided; the other revenue bond structuring provisions would still apply.

Community Facilities Projects

A Community Facilities District (CFD) is a special financing entity through which a local government may levy special taxes and issue bonds if authorized by a two-thirds vote of the citizens in such a district. Facilities which are typically financed are limited to: police protection and court services; fire protection, ambulance and paramedic services; recreation programs; libraries; and parks. A recent amendment to the Mello-Roos Act (upon which CFD's are based), is the 1990 Assembly Bill 2610 (AB 2610). AB 2610 extends the programs which may be financed through CFD's to include solid and hazardous waste projects. Under this act, the CFD may finance the purchase, construction, expansion, improvement, or rehabilitation of any real or tangible solid waste related project or remediation with an expected life of at least five years.

A unique feature of structuring under Mello-Roos is that the sites designated to be included within one CFD do not have to be contiguous. Multiple non-contiguous projects could be included within a single CFD and could span a large geographic radius, such as a city-wide or county-wide CFD. Joint Power Agreements can also be utilized to link separate jurisdictions in forming a cooperative CFD. These features afford local governments and/or developers extreme flexibility in structuring CFD to meet the site specific needs of the community. Because of the 2/3 voting requirement, these CFD could be difficult to form.

Formation of a Community Facilities District may be initiated by the governing body of the local public agency or by petition of registered voters or landowners. The governing body then adopts a resolution of intention to form the District, describes the proposed boundaries of the District, and calls for a report on the public hearing on the formation. At the public hearing, a majority of the registered voters or the owners of more than one-half of the land area within the proposed district may file written protests to the formation, which then stops further proceedings for no less than one year. If a majority protest is not received, the District calls an election on the special tax and the setting of an appropriations limit (pursuant to the provision of Proposition 4, now Article XIIIB of the California Constitution).

The Act leaves the method of apportionment of the special tax to the discretion of the legislative body. Pursuant to Article XIIIA of the Constitution, the tax may not be in proportion to the value of real property, but may be structured on the basis of density of development, square footage of construction, flat acreage, or some other reasonable basis. The computation of the special tax is quite flexible, and is usually prepared by a tax consultant based on an approved formula. Each year the special tax is established in accordance with the formula. This is particularly important in development projects where the tax can be apportioned annually against raw land on one basis and against developed property on another, with the effect of reducing the tax burden borne by the undeveloped property while in the raw state. Of course the special tax formula may be developed on any other reasonable basis.

The Special Tax Bonds are secured by and payable from the proceeds of the special tax. The Community Facilities Act permits great flexibility in the structure of such an issue, so that the repayment provisions can be tailored to match a build-out schedule and any intricacies of the special tax formula. Typically, a debt service reserve fund equal to 10 percent of the par amount of the issue is created from bond proceeds. Also, bond proceeds may include interest that will be due during construction of the facilities plus one year (which delays the imposition of the special tax for an equivalent period).

The use of the Mello-Roos Community Facilities Act to finance facilities and services is still relatively new and is evolving. It has been amended in several areas to make it more workable and to require disclosure of the special tax lien to potential purchasers of improved property. The disclosure requirements may be expected to alleviate, to some extent, the annual public hearing problems encountered by a growing number of public agencies. However, the special tax formulas, which must stay intact for the entire term of a bond issue may be flawed in some respect or not be responsive to changed circumstances (such as changes in land use or failure to complete a development). One alternative is to sell Special Tax Bonds, for raw land development projects in particular, into a Public Financing Authority bond pool (described under the heading of "The Marks-Roos Local Bond Pooling Act of 1985"). As the owner of 100 percent of a Mello-Roos Special Tax bond issue, the Public Financing Authority may amend the applicable bond resolution or indenture to cure any deficiencies or flaws, as long as such amendments do not jeopardize the security for its own bonds. In any event, the formation of Community Facilities Districts for the purpose of issuing Special Tax Bonds has been growing

in recent years, with over $2 billion in debt having been issued under this Act. It is expected to remain as â strongly attractive method of financing public infrastructure for new development projects and is now greatly enhanced by its ability to finance the rehabilitation of environmentally impaired property.

Private Activity Bonds

These types of bonds are available to private businesses to finance projects including solid waste and or recycling related projects. The obligation to service debt from the bond is passed through to the private business. The City or local government guarantor would offer security to debt holders. Examples of this type of financing include bonds issued by the California Pollution Control Financing Authority (CPCFA).

### 10.3.2 Grants and Financial Assistance

California Department of Conservation

This state agency has established a $2 million annual fund to finance litter abatement and or recycling projects including curbside and public education materials. In general, most projects are only available for financing up to $50,000. Applications are due to the Department by January 31, annually.

California Resources Agency

The funding which this agency provides is derived from the Environmental License Plate Fund. Grants are provided mainly for education and public information purposes.

California Integrated Waste Management Board (Recycling Market Development Zones)

The CIWMB is currently investigating the establishment of Market Development Zones to provide funding and other incentives to cities and regions for recycling-related projects..

# SECTION 11

# INTEGRATION COMPONENT

This component summarizes the SRRE and demonstrates how the various source reduction, recycling, composting, and special waste programs achieve the state mandated goals of 25 percent diversion by 1995 and 50 percent diversion by the year 2000.

Program selections by the City are based on the City's desire to provide Woodland residents and businesses the opportunity to participate in waste diversion programs on a voluntary basis. Program selections are also based on providing the most cost effective programs available to achieve the City's waste diversion goals and to participate in County efforts to provide regional waste management programs. Participation in these programs allows the City to take full advantage of economies of scale in the development of regional processing facilities and to provide consistent waste management programs throughout the County.

The following is a summary of waste diversion programs selected by the City for implementation in the short and medium-term planning periods. This summary is then followed by an implementation task schedule which provides an overview of the level of effort, timing, and integration of waste diversion programs selected by the City. Following the integrated implementation schedules, estimates of waste diversion achieved through the City's diversion programs are summarized to demonstrate how the City's programs achieve the state mandated waste diversion goals.

## 11.1 PLANNED SOLID WASTE MANAGEMENT PRACTICES

The City of Woodland has developed an integrated waste management plan that places preferences on source reduction, recycling, and composting programs as management practices for waste generated and disposed of in the jurisdiction. Selected programs provide the means for residential and commercial/industrial waste sectors to participate in waste diversion programs through source reduction efforts and material collection programs provided by the City and the franchised waste hauler.

In addition to providing residents and businesses of Woodland the opportunity to divert wastes through City sponsored programs, the City also plans to participate in regional County integrated waste management efforts to take advantage of economies of scale and to provide consistent waste management programs throughout the County. This will be particularly true for programs which involve large capital investments such as regional processing and composting facilities which would serve the entire County.

The City's solid waste management plan establishes the following programs to meet state mandated diversion goals.

### 11.1.1 Source Reduction Programs Selected

Source reduction programs selected by the City are designed to reduce the quantity of waste generated and disposed of in the City. Selected programs will also provide examples of source reduction methods to local business through City demonstration programs and model non-procurement and procurement policies.

Summarized below are the source reduction programs which have been selected for implementation by the City.

Existing Programs

During the short-term planning period the City will devise methods to identify and quantify the levels of diversion taking place through current source reduction activities in the City. The types of source reduction activities targeted would include thrift shops, repair shops, and other similar businesses.

Quantity Based Variable Rates or User Fees

This alternative has been selected as a contingency measure to facilitate diversion programs should the City fall short in meeting its waste diversion goals. Due to the fact that the current refuse collection rate is incorporated into a larger utility user fee, a feasibility and rate study will be conducted to provide separate refuse service fees and to determine the rates necessary to provide solid waste collection and recycling services to the residential and commercial/industrial waste sectors. This study is scheduled to take place in 1993. A quantity based variable rate structure would be implemented in 1995 if its determined that the City is not reaching waste diversion goals.

Backyard Composting

Backyard composting has been selected for implementation in the short-term planning period to reduce the quantity of yard waste currently disposed. Though yard waste currently collected at curbside is anticipated to be diverted through the County's regional composting facility, City education efforts to promote backyard composting will serve to reduce the quantity of yard waste collected, transported, and composted at the County facility.

The County is currently proposing a tipping fee differential to encourage the source separation of yard waste. Though disposal fees for source separated yard waste will be less than that for normal refuse, City efforts to promote backyard composting will ultimately reduce disposal fees funded for through refuse collection rates.

Awards and Public Recognition Program

This alternative has been selected for implementation in the short-term planning period and will focus on source reduction, recycling, and composting programs developed and maintained through private business efforts. The City will work with the Woodland Chamber of Commerce to seek proper venues to call attention to local businesses. Press releases will also be provided to local newspapers to highlight Woodland business efforts.

Government Non-Procurement Source Reduction Policies

This alternative has been selected for implementation in the short-term planning period and will target materials in the municipal government waste stream. The primary goal will be to improve efficiency in the use of office paper and other products or materials utilized by the City. Through this alternative the City will provide an example of source reduction policies and efforts to the residential and commercial/industrial communities.

Government Procurement Policies

During the short-term planning period the City will develop a procurement policy which will consider product durability, recyclability, recycled material content and potential environmental impacts of materials currently utilized in City operations. This procurement policy will also be promoted as an example to local businesses as to how they can reduce the quantity and toxicity of wastes currently disposed.

### 11.1.2 Recycling Programs Selected

Summarized below are the recycling programs selected for implementation by the City. The City has recently expanded a residential curbside collection program to all single family and several multi-family residences in the jurisdiction. In an effort to provide for greater levels of diversion through recycling activities, the City will also facilitate current commercial/industrial recycling programs through program promotion and technical assistance and, through participation in regional integrated waste management programs, take advantage of County regional processing facilities planned for the short and medium-term planning periods.

Residential Curbside Collection Program Expansion

This program has been selected as a contingency alternative should the City fall short in meeting its diversion goals. Program expansion of current curbside services to all multi-family dwellings is limited by the fact that dwellings greater than 5 units in size are dispersed throughout the City and that a significant percentage of these buildings lack sufficient space to site additional collection containers.

In an effort to facilitate curbside collection of residential dwellings greater than 4 units in size,

the City is planning review building code requirements in the short-term planning period to allow for addition storage space for locating refuse and recyclable material collection containers.

Expansion of curbside collection to all residential units in the City may be implemented in the medium-term planning period depending on the levels of waste diversion achieved through other waste diversion programs.

Increased Commercial/Industrial Collection Programs

This alternative has been selected for implementation in the short-term planning period. Through this alternative, the City's recycling coordinator will facilitate commercial/industrial waste diversion through program promotion and in-person contact with prospective Woodland businesses. The recycling coordinator, in conjunction with the franchised waste hauler, will facilitate the development of company in-house programs; however, site specific program development will ultimately be the responsibility of the hauler.

Commercial/industrial recycling programs will likely target materials with readily available markets. Material types to be targeted will include restaurant and bar glass, cardboard and high-grade paper. Other materials may be targeted on a site specific basis.

The hauler will also be directed to collect restaurant and other food-waste-refuse separately for disposal at YCCL. This will result in a reduction of material contamination in mixed waste loads and will facilitate waste recovery at the proposed County MRF in the medium-term planning period.

Automated Material Recovery Facility

This alternative has been selected by the City for implementation in the medium-term planning period in a cooperative integrated waste management effort with Yolo County and the Cities of West Sacramento and Winters. Through this alternative, the City of Woodland has committed non-source separated commercial/industrial wastes to be diverted to the County materials recovery facility proposed for development in the medium-term planning period.

A feasibility study is scheduled to be undertaken in 1992 by the Yolo County Department of Public Works and Transportation to determine facility parameters, economics, and targeted waste streams for the proposed facility. At this time, policy issues will be developed to determine the County's role in facility ownership, operation, and waste flow controls. Construction of the facility is not expected to take place until 1996. The cost of development, construction, and operation of the facility will be funded through the County Sanitation Enterprise Fund.

Specific waste types to be targeted at the facility will be determined based on available markets, market specifications, and material availability.

### 11.1.3 Composting Programs Selected

The City of Woodland does not have a composting program for yard waste currently disposed; however, the City does have a very successful source separated yard waste collection program for all single family and several multi-family dwellings in the City. In conjunction with the residential collection program, the City will provide for the collection of yard waste generated from the commercial/industrial waste sectors through a separate bin service program. The City will also participate in the County's regional composting program to take advantage of economies of scale and to provide for regional marketing efforts. These programs are briefly summarized below.

Continue Existing Curbside

The City currently offers separate residential curbside collection of yard waste on normal refuse collection days. This program has been very successful in the collection of yard waste and will continue through the short and medium-term planning periods. This program is currently funded through refuse collection fees.

Provide Commercial/Industrial Collection

Based on the Solid Waste Generation Study, the quantity of yard waste generated from the commercial/industrial waste sector is approximately 2,600 tons annually or 3 percent of all waste generated. In an effort to maximize the quantity of waste diverted and to provide commercial/industrial businesses the opportunity to participate in yard waste diversion programs, the City has selected a source separated yard waste collection program for the commercial/industrial waste sectors. Bins will be provided for specified businesses in the City which generate significant quantities of yard waste for diversion. The bins will be serviced on a weekly basis by the franchised waste hauler and yard waste will be brought to the YCCL composting facility.

This program will be implemented by Waste Management of Woodland during the short-term planning period with promotion assistance from the City. Funding for this service will be provided through the commercial/industrial refuse collection fees.

Centralized Regional Composting Site

Through this alternative, the City will divert source separated collected yard waste to a regional composting facility at YCCL. This alternative will be implemented in the short-term planning period due to the economies of scale achieved through regional programs and the lower costs associated with the expansion of the existing YCCL composting operation. This existing operation provides the City the opportunity to achieve maximum diversion levels and also the ability to participate in cooperative regional marketing efforts. Expansion of the existing facility is expected to take place in 1992. Yard waste diversion for the City is expected to take place

during the 4th quarter of 1992.

### 11.1.4 Special Waste Programs Selected

In keeping with the City's policy to participate in regional County integrated waste management programs, the City will participate in the County's Self-Haul Bin Transfer Operations as well as support County efforts to promote and/or require that asphalt and concrete be source separated prior to disposal at YCCL. These programs are briefly described below.

Self-Haul Bin Transfer Operations

The YCCL is currently in the process of developing a "self-haul bin transfer operation" recovering white goods, wood waste, yard waste and other materials in sufficient quantity to target for diversion. The operation is scheduled to commence in the 4th quarter of 1992. Through this alternative the City will promote the use of this facility and encourage residents of Woodland to divert white goods and other wastes not targeted through current diversion programs to this recovery operation.

Concrete and Asphalt Recycling

Through this alternative the City will promote the source separation of inert wastes through public education efforts. Promotions may be in the form of brochures or in-person contact targeting construction/demolition companies doing work in the City of Woodland. The City will also support County efforts in the development of an ordinance to mandate source separation of inert and other wastes. The City will also assist the County in regional market development efforts and will consider revising current City construction specifications requiring percentages of recovered asphalt/concrete materials for new construction.

### 11.1.5 Education Programs Selected

To facilitate the selected waste management programs, the City has identified the following education and public information efforts to maximize levels of waste diversion. The combined focus of these programs will target all waste generators in the City. These programs are briefly summarized below.

Residential Sector Promotional Campaign

Residential instruction/information brochures will be developed stressing source reduction, recycling, composting, and other waste diversion programs taking place in the City. They will be distributed to every applicable residence and utilized at community events to promote City programs. These brochures will also serve as handouts at presentations to service clubs and civic organizations prior to and after the recycling programs are implemented.

Commercial/Industrial Programs

As part of the expanded commercial/industrial recycling program, the City recycling coordinator will assist the franchised waste hauler in the design, development, and implementation of the specific business recycling programs in the City. As individual programs are developed, the City will provide back-up support in the form of source reduction and recycling information materials and suggested implementation plans.

School Curriculum

In cooperation with Woodland Unified School District, the City will assist in the implementation of specific educational programs for all elementary grades (K-6). Although packaged programs are available from the CIWMB and other sources, materials may be adapted to focus on Woodland's specific recycling programs. The City recycling coordinator and school district officials will seek a co-sponsor to participate with the City and/or School District by purchasing and/or offsetting some of the expenses associated with this program.

School Tours

In cooperation with the Yolo County Department of Public Works and the City's franchised waste hauler, tours will be arranged to provide students the opportunity to visit YCCL and the Waste Management processing facilities. Additional student tours may also be set up with local businesses and institutions which have special recycling programs or process recycled materials.

Business Recognition Program

The City, in cooperation with the Woodland Chamber of Commerce or other business organizations, will establish recycling and source reduction recognition events. A full spectrum of awards can be presented to those firms establishing recycling and source reduction programs with special acknowledgements going to major diversion efforts or other significant achievements.

Media Advertising & Releases

The City will purchase advertising space in the Daily Democrat to show the progress and success of the various recycling and source reduction programs. A quarterly update report on waste diversion activities will be made available to local newspapers to increase awareness of recycling programs and the City's progress towards meeting diversion goals.

In addition to the paid advertising campaign, the City will produce and transmit appropriate releases to all media throughout the Woodland area regarding the various aspects of the recycling and source reduction programs. These releases will be targeted towards new programs and to serve as reminders on how to participate in ongoing waste diversion alternatives.

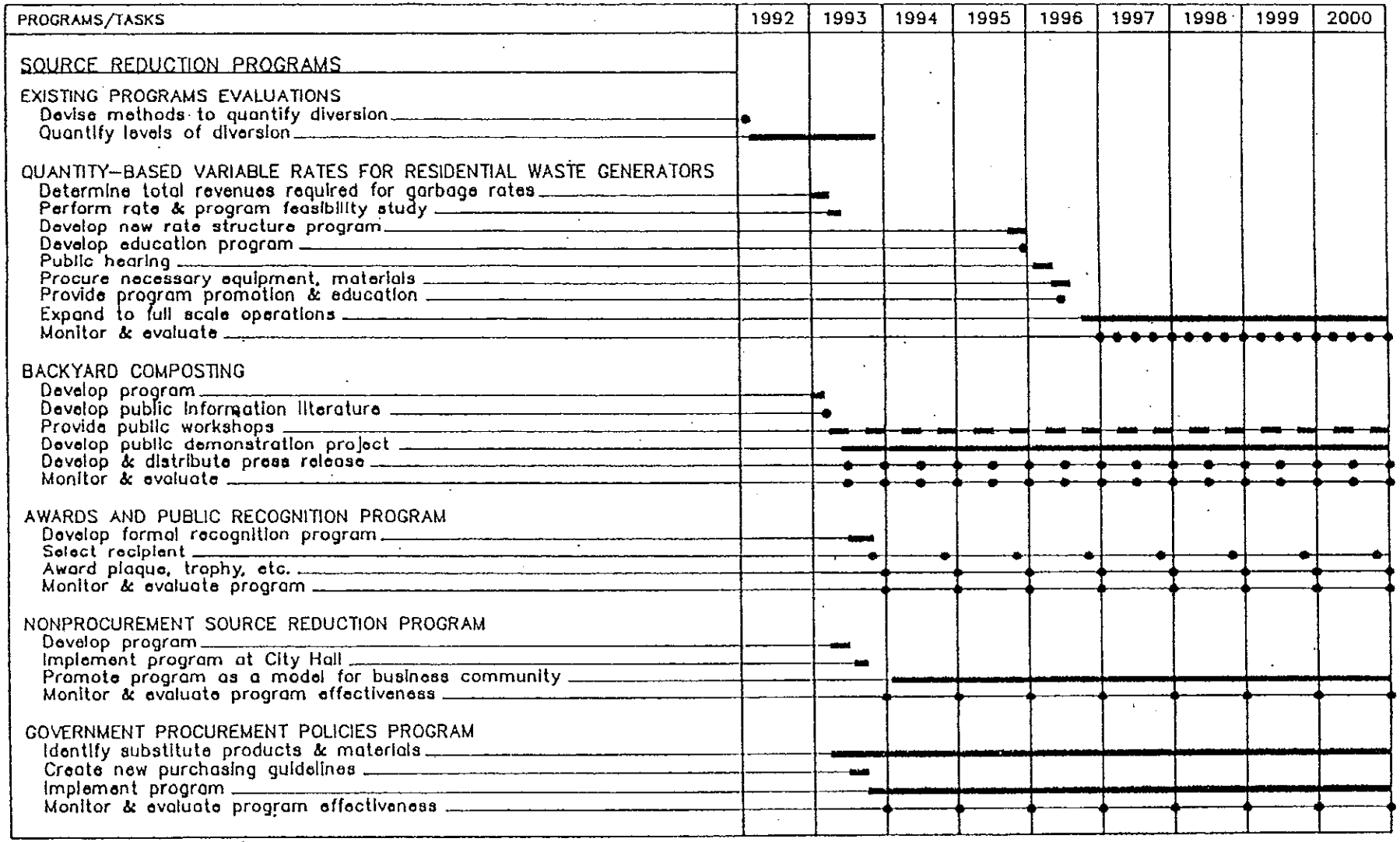
Community Events

The City will take part in promoting recycling at community events and other local activities such as the County Fair and Cruise Night. In most cases promotional information will be offered to attendees.

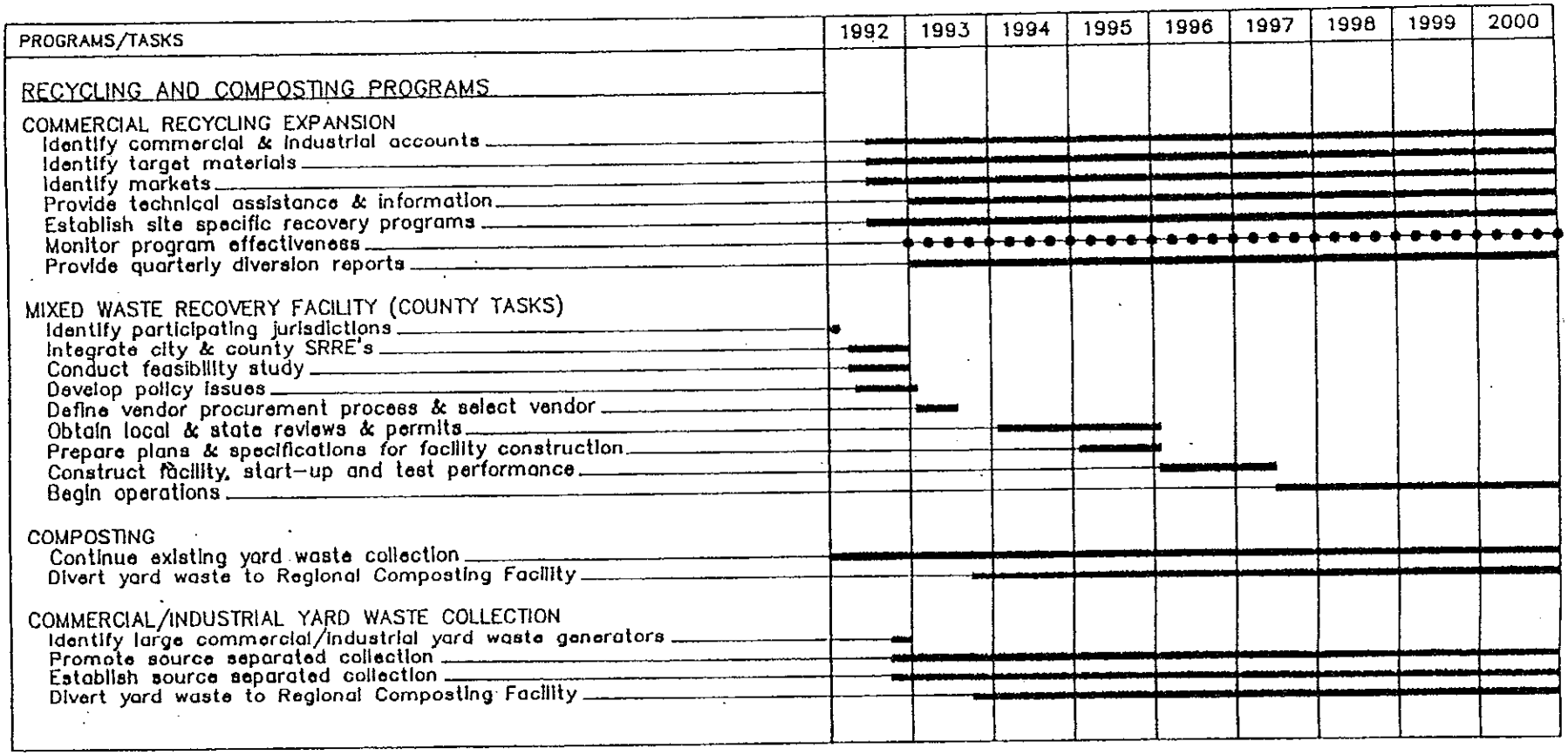
## 11.2 PROGRAM IMPLEMENTATION

Integrated program implementation schedules for selected programs are located in Tables 11.1 through 11.4.

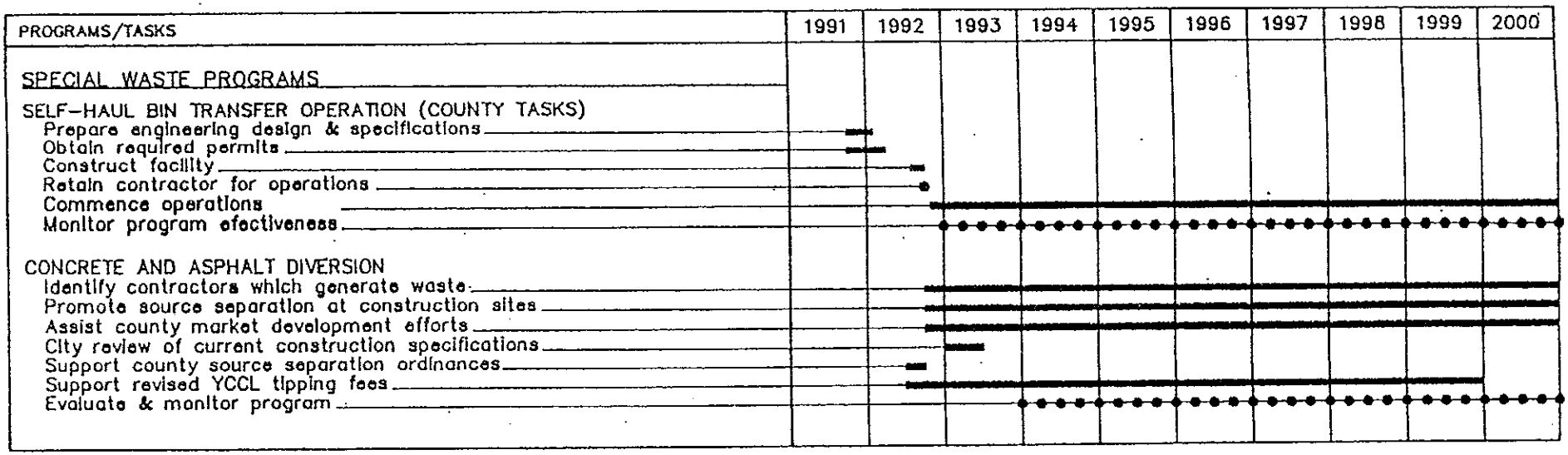
# 11-1 IMPLEMENTATION SCHEDULE FOR SOURCE REDUCTION PROGRAMS



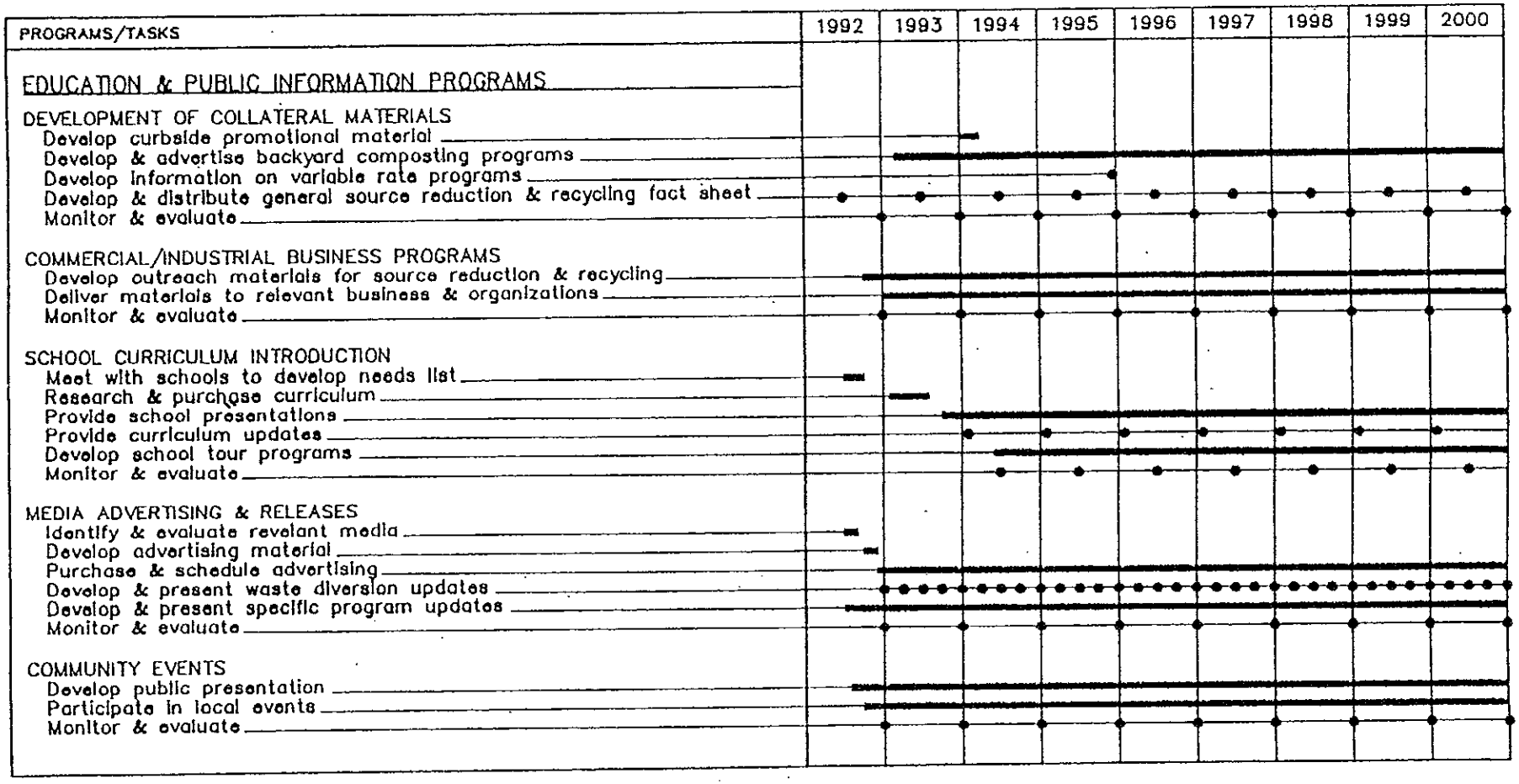
# 11-2 IMPLEMENTATION SCHEDULE FOR RECYCLING & COMPOSTING PROGRAMS



# 11-3 IMPLEMENTATION SCHEDULE FOR SPECIAL WASTE PROGRAMS



# 11-4 IMPLEMENTATION SCHEDULE FOR EDUCATION AND PUBLIC INFORMATION PROGRAMS



## 11.3 WASTE DIVERSION PROJECTIONS

Table 11-5 illustrates how each program contributes to meet the City's waste diversion goals in the short and medium-term planning periods. Diversion estimates for most source reduction programs have not been provided due to the difficulty in quantifying diversion levels for each individual program.

# Table 11-5. Diversion Rate Projections (percent)

| Program | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Source Reduction Diversion Programs** | | | | | | | | | | |
| Existing Conditions | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| Quantity Based Variable Rates | | | | | | | | | | |
| Backyard Composting | | | 0.7 | 0.1 | 1.0 | 1.4 | 1.4 | 1.5 | 1.5 | 1.5 |
| Awards and Recognition | | | | | | | | | | |
| Non-procurement | | | | | | | | | | |
| Government Procurement policies | | | | | | | | | | |
| Total Source Reduction | 0.07 | 0.07 | 0.77 | 0.17 | 1.07 | 1.47 | 1.47 | 1.57 | 1.57 | 1.57 |
| **Recycling Diversion Programs** | | | | | | | | | | |
| Existing Recycling | 17.9 | 17.9 | 17.8 | 17.8 | 17.8 | 17.8 | 17.7 | 17.7 | 17.7 | 17.7 |
| Existing Curbside | | 1.32 | 1.52 | 1.83 | 1.83 | 1.83 | 1.83 | 1.83 | 1.83 | 1.83 |
| Expanded Commercial/Industrial Recycling | | | 1.7 | 3.2 | 4.7 | 5.5 | 6.0 | 6.0 | 6.0 | 6.0 |
| Automated Material Recovery | | | | | | | 4.1 | 8.1 | 12.2 | 15.3 |
| Existing Transformation | | | | | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 |
| Total Recycling | 17.90 | 19.22 | 21.02 | 22.83 | 24.33 | 26.73 | 31.23 | 35.23 | 39.33 | 42.43 |
| **Composting Diversion Programs** | | | | | | | | | | |
| Curbside Yard Waste Collection | | | 11.4 | 10.9 | 10.9 | 10.8 | 10.6 | 10.6 | 10.6 | 10.6 |
| Commercial/Industrial Collection | | | 0.2 | 0.4 | 1.2 | 1.4 | 1.6 | 1.6 | 1.6 | 1.6 |
| Total Composting | — | — | 11.60 | 11.30 | 12.10 | 12.20 | 12.20 | 12.20 | 12.20 | 12.20 |
| **Special Waste Diversion Programs** | | | | | | | | | | |
| Self-Haul Bin Transfer Operations | | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 |
| Concrete/Asphalt Recycling | | 1.0 | 1.4 | 1.7 | 1.7 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 |
| Total Special Waste | — | 3.70 | 4.10 | 4.40 | 4.40 | 5.30 | 5.30 | 5.30 | 5.30 | 5.30 |
| TOTAL DIVERSION | 17.97 | 22.99 | 37.49 | 38.70 | 41.90 | 45.70 | 50.20 | 54.30 | 58.40 | 61.50 |

# APPENDIX A

# AVAILABLE MARKETS

# APPENDIX A

## PAPER MARKETS

| | |
|---|---|
| Independent Paper Stock<br>4800 Florin-Perkins Road<br>Sacramento, California | Accepts newspaper, cardboard, high-grade paper and other mixed grades. Aluminum and metal cans, sorted glass, and PET is also accepted. |
| Weyerhaeuser Company<br>50 South River Road<br>West Sacramento, California | Accepts 14 different grades of waste paper. |
| Keyes Fiber Company<br>8450 Gerber Road<br>Sacramento, California | Accepts newspaper as a raw material in the manufacturing of packaging materials. |
| Gold Bond Building Products<br>800 West Church Street<br>Stockton, California | Accepts cardboard, high-grade paper, and mixed paper for product manufactor. |

## METAL MARKETS

| | |
|---|---|
| Proler International<br>15332 South McKinley Avenue<br>Lathrop, California | Accepts tin and ferrous materials only. |
| Reynolds Aluminum<br>777 Arden Way<br>Sacramento, California | Accepts CA Redemption containers, copper, and scrap aluminum. |
| C & C Metals<br>11320 Dismantle Court<br>Rancho Cordova, California | Accepts CA Redemption containers, copper, scrap aluminum, ferrous metals, and white goods. |

| | |
|---|---|
| Schnitzer Steel<br>12000 Folsom Blvd.<br>Rancho Cordova, California | Accepts ferrous metals, white goods, non-ferrous metals, and tin cans. |
| Altas Metals<br>30 Arden Way<br>Sacramento, California | Accepts scrap alumunum. |
| Barbary Coast Steel<br>4300 E. Shore Hwy.<br>Emeryville, California | Accepts ferrous metals. |

## GLASS MARKETS

| | |
|---|---|
| Anchor Glass Container<br>1400 W. 4th St.<br>Antioch, California | Accepts flint cullet only. |
| Anchor Glass Container<br>P.O. Box 3427<br>22302 Hathaway Ave.<br>Hayward, California | Accepts green and flint cullet only. |

## PLASTIC MARKETS

| | |
|---|---|
| Bags Again, Inc.<br>1300 South El Camino Real, Suite 300<br>San Mateo, California | Accepts post consumer Low Density Polyethylene (LDPE) |
| Bay Polymer Corporation<br>44530 Grimmer Blvd.<br>Fremont, California | Accepts post consumer HDPE, LDPE, PS, PVC, and PP. |
| Certified Polymer Processors, Inc.<br>540 Stone Road, Unit J<br>Benicia, California | Accepts post consumer HDPE. |

| | |
|---|---|
| Deer Polymer Corporation<br>3410 Geary Blvd.<br>San Francisco, California | Accepts post consumer LDPE, PET, PP, PS, PVC, and other plastics (Resin Broker) |
| Engineered Resource Recovery Inc.<br>P.O. Box 1226<br>Lafayette, California | Accepts post consumer LDPE and PET. |
| Joe's Plastics, Inc.<br>7065 Paramount Blvd.<br>Pico Rivera, California | Accepts HDPE, LDPE, PP, and PS. |
| Marketing Associates Inc.<br>1818 N. Orangethorpe Park<br>Anahiem, California | Accepts all post consumer plastics. |
| Talco Plastics Inc.<br>11550 Burke St.<br>Whittier, California | Accepts post consumer HDPE, LDPE, PET, PP, PS. |
| Tech Polymers<br>P.O. Box 4429<br>Berkeley, California | Accepts all post consumer plastics. (Resin Broker) |
| U.S. Recycling Industries<br>1800 Harrison Street, Suite 1100<br>Oakland, California | Accepts post consumer HDPE, LDPE, PET, PP, PS, PVC, and other plastics. |