7. PREFERRED REGIONAL WASTE MANAGEMENT SYSTEM

7.1 INTRODUCTION

The preferred regional waste management system was selected following an analysis of the existing system and an evaluation of input from the local jurisdictions and the TAC. This chapter discusses the management system for only the municipal solid waste (MSW) stream that includes residential and commercial wastes. Currently, the private sector is successfully managing the construction and debris and the industrial waste steams and is expected to continue to do so. The preferred MSW management system consists of the following components:

- Source Reduction and Reuse, Recycling
- Waste Collection and Transfer & Waste Disposal

Discussion of the waste management system is divided into sections corresponding to these components.

Source reduction and material reuse are discussed as a means for reducing the amount of MSW generated. These components rely heavily on educational and promotional programs. These programs and their results are limited in scope.

Recycling has been selected to continue to be the primary component of the waste management system for reducing the waste stream prior to disposal. There are several reasons for this decision. They are:

- Localities must maintain the 25 % level of recycling mandated by the state;
- Numerous recycling programs exist within the CVWMA region, including the Authority's own curbside and drop-off programs; and,
- A level of acceptance for recycling exists among residents of the region.

The selected program provides for the continuing collection of principal recyclable materials (PRMs) consisting of paper products, glass, aluminum, ferrous materials, and plastic. PRMs are collected from regional drop-off centers and from household collection routes.

Collection and transportation represent major costs in the disposal of solid wastes. These components of the waste management system are handled primarily by the private sector in the CVWMA region with some involvement by local governments in the more urban areas. The preferred waste management system continues the existing combination of waste collection and transportation provided by the public and private sectors.

7.2 PREFERRED WASTE MANAGEMENT SYSTEM COMPONENTS

7.2.1 Source Reduction and Reuse

Source reduction and reuse components selected for the preferred waste management system address only the MSW portion of the waste stream. These programs entail minimal input from the CVWMA staff relying instead on assistance from the Departments of Environmental Quality, the Virginia Cooperative Extension Service, local schools, local litter control and recycling coordinators, recycling organizations, businesses, and other volunteer groups.

Program objectives include increasing, on a voluntary basis, the number of households leaving grass clippings on lawns, and/or composting leaves and grass. Program objectives also include changing consumer purchasing habits to focus on minimal packaging; the purchase or exchange of reusable and used products (through yard sales and product exchanges); and the purchase of products made from recycled or recyclable materials. Other program objectives include facilitating charity collection programs and encouraging the reuse or reduction of special wastes. Some source reduction and reuse will occur, even without an aggressive formal program.

Because of the minimal involvement by the CVWMA staff with these program components and unknowns associated with a reliance on volunteer help, estimates of program costs are not included with this plan. It is known, however, that success of these programs is tied to the amount and quality of community outreach and public education provided. Fortunately, many citizens are eager to reduce the waste stream and there are existing networks of communication within and among local jurisdictions for waste stream reduction programs. This plan assumes that the role of the CVWMA staff will be to coordinate on a regional basis, to the extent possible, the various groups and localities participating in source reduction and reuse. The overall direction in this area will be to encourage waste reduction and reuse by the general public and by the private and public sections where possible.

7.2.2 Recycling

The objectives of the recycling program are to reduce the amount of MSW requiring disposal in landfills, and to save energy and resources that would go into making new products from the same materials. The recycling component of the regional waste management system is divided into residential and commercial programs. During 2002, recycling programs underway in the CVWMA region have diverted 329,298 tons of recyclable materials from the MSW stream. These recyclable materials include 153,600 tons of the primary PRMs, 104,000 of yard waste, and 72,000 tons of other recyclable materials. Of this total, CVWMA and the local jurisdictions actively managed 115,000 tons of recyclable materials including:

- 31,000 tons collected through the curbside program
- 5,000 tons collected at the drop-off centers
- 74,000 tons of yard waste
- 5,000 tons of other recyclables

Commercial recyclers performed the remaining portion of the area’s total waste diversion.

Residential: The preferred recycling program selected for the residential waste stream provides for collection of the PRMs that include: aluminum, paper products, glass containers, plastic bottles, and steel cans. Yard wastes will also be collected from some city neighborhoods and suburban areas of the region. The CVWMA will continue to coordinate residential curbside and drop-off programs. Individual localities will supplement this with their own programs as they recognize the need. Existing programs will be expanded, as appropriate and new programs will be instituted as needed. Map 6 identifies generalized locations of projected urbanized areas to help identify potential program expansion for planning purposes.

The residential recycling component calls for a mix of offerings available to the participating jurisdictions including:

- Regional drop-off centers for the collection of recyclable materials
- Weekly or bi-weekly curbside collection of recyclable materials

Currently, the CVWMA curbside recycling program is available to approximately 230,000 households in the Region. It is anticipated that this total will increase, as new subdivisions are built within or contiguous to existing curbside collection areas. The general nature of the methodology to identify and make population density estimates as depicted in Map 6, preclude more precise data at this time.

Continued success of the recycling programs depends largely on the rate of participation. Efforts will continue to increase participation rates for existing programs. One way to measure success of the program is by how much it reduces the waste stream, the higher the participation, the greater the reduction in the waste stream.

Commercial: The recycling program selected for the commercial waste stream will target cardboard, office paper, yard waste, glass, metal, and other materials. Commercial recycling rates are sensitive to cost and to levels of education and promotion within communities.

For the most part, commercial and industrial recycling will be carried out on a voluntary basis by the private sector. The goal of the CVWMA is to continue to meet the state mandated recycling levels by establishing reasonable target levels within the various components of the waste stream. The target level for commercial recycling is 10 percent of the commercial waste stream. As stated above, rates of commercial recycling are sensitive to public education and promotion aimed at the private sector.

The strategy for the plan's commercial and industrial recycling programs is to rely on the free market and on state agencies and volunteer organizations supported by the CVWMA staff or local jurisdictions to make this component of the plan successful. The CVWMA will work with various trade organizations, local recycling coordinators, and volunteers to facilitate commercial recycling opportunities and provide education as requested. The CVWMA will also work with commercial haulers to identify potential markets for their services.

The planning district commissions, CVWMA and its member governments will attempt to collect and refine data to evaluate the success of programs and the rate of commercial and industrial recycling.

7.2.3 Waste Collection and Transportation

The existing system of solid waste collection and transportation throughout the region is to be continued through the planning period. The system is divided between the private sector, which operates under both free market and franchise conditions, and the public sector.

The assumption of this plan is that collection of recyclable materials under the preferred waste management system will reflect the system of solid waste collection that is in place. Techniques of collection and service providers will remain essentially the same.

However, as publicly owned landfills are phased out over the next 20 years, it may become necessary for the CVWMA or its member jurisdictions to provide one or more additional transfer stations / convenience centers.

7.2.4 Waste Disposal

The method of disposal selected for the preferred waste management system is landfilling. The present system of landfills is projected to be able to provide disposal capacity throughout the period covered by this plan. Surplus capacity exists in existing facilities within or contiguous to the service area. Over the course of the planning period the Region will continue its transition from a mix of public and private landfills utilized for Regional waste disposal to all private landfills. The two remaining public landfills will be closed during the planning period.

7.3 COSTS AND ASSUMPTIONS

Annual costs for the preferred waste management system, expressed in 2003 dollars are estimated to be about $54 million. Due to the variety of programs and methods for funding them by the various jurisdictions and the role of the private sector, estimating annual costs of the preferred waste management system is not exact. The following section provides a breakdown of some of the costs of the solid waste management system by selected component costs. Where appropriate, the assumptions used to compute those estimated costs are included.

Estimated annual operating costs include MSW and recycling programs provided to jurisdictions by the CVWMA and other programs established by the jurisdiction and the private sector where information is available. As mentioned previously, costs for the source reduction and reuse and commercial components of the program are not estimated because of the limited involvement anticipated for the CVWMA staff.

It should be noted in the following analysis, where program costs are averaged for households, that an average household size of 2.53 persons was used for the entire CVWMA region. Where program costs are averaged by population, it is estimated that each person generates 4.51 pounds of MSW per day according to the EPA. Estimates for all annual costs are given in present (2003) dollars. They are derived from a combination of existing program costs, industry standards, and

the best professional judgment of the CVWMA staff and its consultant.

7.3.1 Preferred System - Recycling

Residential: Services for drop-off centers, curbside collection, operation of yard waste processing facilities and other CVWMA recycling programs will continue to be contracted to private firms under separate contracts to the CVWMA where they are competitive with the costs of publicly owned or operated facilities. Anticipated revenues from sale of recycled materials are subtracted from program costs. Some localities such as Hanover and Chesterfield may operate their own yard waste processing facility. In addition to CVWMA programs, some localities may operate their own recycling programs.

Curbside Recycling – The cost of the CVWMA curbside recycling program for collection and processing of PRMs is approximately $3,900,000 annually plus overhead cost (FY 2003) in six jurisdictions. This represents $1.40 per household per month for bi-weekly service and $2.14 per household per month for weekly service. Current cost for the curbside collection and processing of recyclable materials average about $125 per ton for the 31,000 tons collected.

An average of 35% of eligible homes set out materials in the curbside program and the average set out is about 30 pounds per home. Actual participation in the program is believed to be higher since not all participants set out every collection day.

Drop-Off Recycling – Cost factors for the CVWMA drop-off center programs include: land, improvements, equipment, transportation, maintenance, material processing, administration and education. Current costs for the CVWMA drop-off program to the participating localities is approximately $72 per ton of recycled material and approximately 5,000 tons was collected in FY 2003 for a total cost, net of revenues from the sale of recyclables of $360,000. This includes container rental, collection, and transportation, processing and marketing of the material.

In addition to the curbside collection and the drop-off program the CVWMA has procured and negotiated favorable contracts with vendors for the collection and processing of other recyclable materials. Each member jurisdiction selects from the menu of programs best suited for the locality and the contract fees are born by the locality through the CVWMA. Other programs to meet specific needs are managed locally.

- Appliances / Metals: The locality pays a monthly container rental fee, a per ton processing fee and a per haul collection fee. The value of the material, tied to a monthly market index, is subtracted from the cost. Depending upon market conditions this program may be a cost or a revenue stream.

- Propane Tanks: The vendor pays a small fee to the CVWMA who in turn reimburses the locality for each propane tank collected.

- CFC/HCFC: The participating jurisdiction pays a fee for each unit (air conditioners, refrigerators etc.) from which the CFC/HCFC s are extracted and recycled prior to the unit being recycled.

- Waste Tires: The vendor provides the participating localities with a trailer where used tires are stored. When the trailer is full the vendor switches out the trailer and recycles the tires. A per ton fee is paid by the participating locality for this service.

- Used oil and Antifreeze: The locality pays a small annual site fee for each site collecting these materials. The contractor collects the materials from the sites on an as-needed basis, processes it, and markets it at no additional cost.

- Paints and Used Oil Filters: A collection and processing fee is charged to the locality for each 55-gallon drum of paints and for each 30-gallon drum of oil filters collected.

- Agricultural and Yard Waste Recovery and Grinding: The participating locality incurs an hourly rate for grinding and processing of yard waste or a per ton fee to recycle leaves at various farming facilities in the region.

Market conditions play a role in the cost of many of the CVWMA and local recycling programs as the contracts for materials such as OCC, metals and ONP contain revenue sharing clauses with floor and ceiling prices tied directly to market indexes.

Commercial: Costs for the commercial component of the recycling program are not itemized in this plan. Involvement by the CVWMA staff in the foreseeable future is anticipated to be minimal. There will be reliance on the free market and on volunteer and trade organizations, commercial recycling and state agencies to make this component of the program successful.

7.3.2 Preferred System - Jurisdictional Recycling Costs

Efficient implementation of the preferred recycling program among the individual jurisdictions requires selection of the program components that are most appropriate based on the overall needs the jurisdiction. The programs are selected by the local jurisdiction that pays the costs or fees associated with the program.

7.3.3 Preferred System - Collection and Transportation

Costs for collection and transportation of recyclable materials are included with the overall recycling program costs. Costs for collection and transportation of the remainder of the MSW (including non-recovered recycled materials) are calculated separately.

Collection includes that portion of the solid waste program that gets solid waste and/or recyclables from the generator to a transfer or processing facility prior to disposal. For the low-density component of the program, it includes the operation of MSW convenience center sites. In medium density areas, it includes the household collection process. In high-density areas, MSW collection includes the operation of dumpster sites.

Transportation takes up where collection leaves off. It includes the movement of MSW from any transfer station or processing facility to a landfill. It also accounts for long hauls between

collection routes and landfills.

7.3.4 Preferred System - Waste Disposal

Materials not diverted from the waste stream through source reduction, recycling and reuse will be landfilled. Landfilling costs in the CVWMA region currently average approximately $25/ton delivered.

This cost is reflected in the tip fees charged by the jurisdictions and the private sector for the use of their facilities. Under the preferred waste management system, approximately 489,000 tons of MSW will be landfilled annually at an estimated cost of $12.3 million (current dollars).

7.3.5 Preferred System - Total Costs

The annual estimated costs of the preferred waste management system for MSW and recycling is estimated to be approximately $54 million, excluding costs for the waste reduction and reuse components of the system. The CVWMA manages approximately $9.7 million annually (2003) of the MSW and recycling programs in the region. The remaining costs were estimated based on information collected from localities and the private sector for other recycling and MSW programs assuming an average cost per ton and collection costs compared to that of CVWMA programs. Table 8 below estimates annual costs by component.

Table 8

Estimated Annual Costs – Preferred Waste Management System

System Component	Component Cost
Recycling Programs	$18.4 million
MSW – (collection, transportation and disposal)	$35.8 million
Total	$54.2 million

7.3.6 Avoided Landfill Costs

Materials diverted from the waste stream prior to disposal, through recycling or some other means, reduce the amount of wastes that ultimately end up in a landfill. Decreasing the amount of material requiring final disposal increases the operating life of landfills and may defer costs associated with permitting and construction of facility expansions and of new facilities.

There can be some cost savings in the short term, but they should be carefully calculated. The

reasons for caution include the following: costs for landfills are mostly up-front, capital costs associated with site acquisition, design, permitting, and construction, these are long-term, financed costs. The only real savings realized in the short-term are the landfill operation and maintenance costs. In addition, a jurisdiction only saves money by not landfilling if the alternative is less expensive.

At an average cost of $25/ton disposal (not including transportation and collection), the CVWMA jurisdictions saved approximately $2,875,000 in FY 2003 by recycling the 115,000 tons (including 74,000 tons of yard waste) of material that would have been landfilled. For comparison with the avoided landfill cost, CVWMA costs for collection and processing of PRM's approximate $4,300,000 for the diversion of 41,000 tons of material (about $105 per ton). Thus, there is a cost of approximately $80 per ton associated with area residential recycling programs. This cost is a significant factor that must be borne by the area jurisdictions and it leads to difficult choices when confronted with the public's desire to recycle and the realities of available funds and other needs.

7.3.7 Cost Comparison of Preferred to Existing System

Total costs for the waste management systems employed by the CVWMA jurisdictions are difficult to estimate. This is due to the wide variety of waste management systems used by the jurisdictions, and because of the various methods used by the jurisdictions to fund these programs and account for system costs. Under the preferred waste management system, the total cost of landfilling is to continue at this level. The same is true of the other programs and practices. The existing solid waste management system is meeting the needs of the jurisdictions and is exceeding the state mandated recycling level. Since the preferred waste management system is a continuation of the existing system, costs are not anticipated to be significantly different from current costs.