

**REGIONAL SOLID WASTE MANAGEMENT PLAN**

**PREPARED BY**

**THREE RIVERS SOLID WASTE AUTHORITY**



**FOR**

**COUNTIES OF  
AIKEN – ALLENDALE – BAMBERG – BARNWELL  
CALHOUN – EDGEFIELD – MCCORMICK  
ORANGEBURG - SALUDA**

**NOVEMBER 4, 2009**



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## **1.0 EXECUTIVE SUMMARY**

On December 15, 1992, the following nine counties were officially chartered by the South Carolina Secretary of State as members of the Three Rivers Solid Waste Authority (TRSWA): Aiken, Allendale, Bamberg, Barnwell, Calhoun, Edgefield, McCormick, Orangeburg, and Saluda. TRSWA is a political subdivision of the state of South Carolina. This Plan presents the solid waste policy and management planning approved by the member counties.

The law mandates that county governments develop plans and programs in order to assure delivery of solid waste management services to residents and businesses within the counties' jurisdictional boundaries. The counties of this region created a "joint agency" to have the authority and responsibility to handle certain aspects of solid waste management. As such, the agency operates as a separate body politic and corporate (regional government), with each member county appointing a representative to the Board of Directors. Each County Administrator is a non-voting member of the Board of Directors. The Authority is the regional planning agency for solid waste management for the counties; however, each County Council reviews and approves the Plan. All elements of this Plan have been discussed and coordinated with the counties and municipalities of the region, and all elements of the Plan has been discussed and developed with the regional Solid Waste Advisory Committee (SWAC). Any ordinances required to implement or support this Plan are enacted on the local level and approved by the elected officials for local governments.

TRSWA serves nine counties plus the Savannah River Site (SRS). The municipalities of the Three Rivers Solid Waste Authority are also included in this Plan. There are three major urban centers in the region: Aiken, North Augusta, and Orangeburg. These three cities each serve metropolitan areas with populations between 30,000 and 40,000. They help bring a base of industry, academia, and government to make the region as a whole more economically diverse and stable. They also individually manage sizable solid waste recycling programs that include composting and, in the case of North Augusta, a Materials Recovery Facility. There are more than sixty incorporated municipalities in the region, and most of these towns are rural in nature, with populations of less than 3000. In addition to the three municipalities already mentioned, municipalities with populations between 3000 and 7000 are: Allendale, Bamberg, Denmark, Barnwell, Williston, St. Matthews, Edgefield, Johnston, Saluda, and McCormick.

Solid waste management in the future will be more costly than in the past, and there will be more demand for technical expertise. With that in mind, lawmakers have encouraged regionalization because of economies of scale and the ability to share resources technically and monetarily. Treatment and disposal of solid waste in the future will require large, modern facilities with specially trained staff and specially designed handling equipment. While the Three Rivers region encourages local waste management and recycling programs, the goal of the nine counties is to establish and maintain a regional system that capitalizes on economies of scale to reach or exceed reduction, diversion, and recycling goals. In that regard, TRSWA endeavors to make partnerships with municipalities, counties, and private companies in order to deliver to its citizens the most effective and efficient solid waste management programs.

The nine counties endeavor to follow the mandates established in the South Carolina Solid Waste Policy and Management Act (SCSWPMA) and accept the unique responsibilities and authority given to them under that Act, including the responsibility for planning and coordination of solid waste management in the region. SCSWPMA encourages regionalization. It is the intent of this Regional Plan, in part, to establish policies that are consistent with SCSWPMA and capitalize on benefits gained from economies of scale so that the greatest number of citizens receives the greatest benefit at the least cost. The Plan is subject to change when such change is deemed to be in the best interest of the region.

The region's goal is to manage solid waste in ways that benefit the quality of life for its citizens. In that regard, TRSWA may implement policies, and/or may encourage municipalities or counties to enact ordinances, that serve to improve the quality of life for the region, even when a financial cost is associated (e.g. litter control). The counties will continue to analyze programs with the goal of benefiting the region as a whole. TRSWA and the counties will engage in ongoing evaluation of programs and systems operated in the region. It is the region's goal to divert fifty percent (50%) of the region's MSW to composting and/or recycling and/or waste transformation facilities. Collectively, composting, recycling, and waste transformation are all "waste recovery" systems.

In order to promote proper solid waste management, the South Carolina Solid Waste Policy and Management Act (SCSWPMA) establishes several statewide policies that are of significance to this Plan. The Act states a policy of the reduction of waste at the source of generation, and the Act encourages recycling and reuse of materials prior to either incineration or landfilling. Thus, while the Act recognizes that properly designed and operated landfills will always be necessary, it calls on local governments to try to divert recoverable materials from landfills by establishing comprehensive waste management systems involving recycling and reduction efforts. SCSWPMA is consistent with the EPA Waste Management Hierarchy which prioritizes environmental attributes of waste management as follows: 1) Reduce, 2) Reuse 3) Recycle; 4) Recover for energy; and 5) Landfill. The region supports the environmental objectives of the EPA Waste Management Hierarchy and also supports SCSWPMA as it regards the economic and financial implications of waste management options. The region recognizes the fact that the EPA Waste Management Hierarchy is based on environmental considerations, and it is often a challenge to successfully blend those considerations with financial considerations. In that regard, the region's policy makers consistently weigh costs versus benefits in an attempt to achieve the most practical combinations of policies to achieve the most benefit for all citizens.

The counties of this Region are charged by law with the responsibility to ensure the proper disposal of solid waste for all residents and businesses within their jurisdictional boundaries. While the counties do not believe that government needs to provide all services, and will encourage the development of private business in this field where appropriate, it is the policy of this Region that the Authority and member counties will make the determination as to what is appropriate for municipalities and private industry. For treatment and disposal facilities, preference will be given to facility ownership and operation by a governmental entity unless the disposal facility is to be used exclusively for the disposal of waste materials generated by the

owner-operator of the disposal facility. The Region encourages the collections of MSW by private companies, subject to certain guidelines established by governments in order to encourage reduction, reuse, recycling, energy recovery, and development of cost effective and environmentally sound innovations. The Authority and/or its member counties reserve the right to enact programs that will be supported by appropriate legal and financial mechanisms so that collection and hauling practices are consistent with the management methodologies established by the regional governments. Commercial, industrial, and residential MSW is best collected at curbside or commercial loading areas, using trucks that have systems which effectively encase the MSW for Transport, so as to avoid litter problems.

TRSWA and its member counties, working together, provide a network for the management of solid waste. This network does not provide for the management of hazardous or medical wastes, nor does it provide for the management of industrial solid wastes that are handled exclusively by the industrial facility that generates them. Currently, the regional network involves the following major components: 1) Convenience Centers, designed to provide a greater level of education and recycling activity; 2) Class 2 landfills for burial of inert materials such as construction and demolition debris, land-clearing debris, and inert industrial wastes; 3) Transfer Stations, designed to pre-sort and divert some recyclables and compact other wastes for ultimate landfill disposal; 4) Materials Recovery Facilities (MRFs), designed to separate recyclables into usable and sellable units; 5) Recovered Materials Baling Operations (RMBOs) designed to process segregated recyclables into marketable units; 6) a Subtitle D (Class 3) landfill for burial of all municipal solid waste (MSW) and industrial solid waste not treated through other means; 7) Collection and Transport systems for delivering various materials to the correct points of destination; 8) Composting facilities for compost/grinding of appropriate waste materials, designed to reduce volumes going into landfills and produce usable products from waste; and 9) Collection and Processing facilities for "Specific Wastes" such as waste tires and used oil. This Plan will describe each of these components in more detail and will provide an assessment of the efficiency and necessity for each component.

All counties and municipalities in the region have abolished uncontrolled green box sites and established collection centers or, preferably, curbside pickup by approved contractors. The region seeks to have MSW separated into five categories at the collection point - (1) recyclables, (2) inert (Class 2) buriables, (3) "Specific" wastes, (4) "Special" wastes, and (5) Subtitle D (Class 3) buriables. These broad categories will be further refined into subcategories according to processing capabilities and economic considerations. For instance, residuals and rejects from the "recyclables" stream will be further processed so as to manufacture process-engineered fuel (PEF) rather than landfilling high-energy wastes. TRSWA encourages the recycling of construction and demolition debris and land-clearing debris (C&DLCD). TRSWA encourages composting. Though C&DLCD materials are not currently included in the definition of MSW, the region encourages the development of systems to recycle these materials where practical. Waste Recovery systems are not limited to recyclables. The region supports recovery for energy but does not support mass-burn incineration of MSW. In some cases, specific wastes or special wastes can be recovered for beneficial use. Another example of a recovery system is a landfill gas recovery system that recovers energy from the buried waste materials.

Most commercial MSW in the region is picked up by private haulers. This practice will continue, with the haulers taking the wastes to the transfer Stations, MRFs, RMBOs, or landfill sites. The Region will encourage these haulers and generators to utilize the facilities established for recycling, with government-operated facilities providing financial incentives for private participation. The region supports a fee structure that provides financial incentives through which generators can discard source-separated recyclables with no fee, can discard commingled recyclables at a nominal fee, and discard non-separate MSW at the highest fee.

Section 44-96-290(F) of the Solid Waste Policy and Management Act states that no permit to construct or expand a solid waste management facility may be issued unless the proposed facility or expansion is consistent with the local or regional solid waste management plan. In that regard, TRSWA is the planning agency for solid waste facilities for the region. The Authority and its member counties support the position that any treatment or disposal facility constructed in the Region must be held to be consistent with this Plan. In that regard, the region desires to limit disposal of MSW to no more than one landfill, with an annual tonnage limitation of 500,000 tons. The region supports expansion of the Authority's Regional Subtitle D (Class 3) MSW Landfill through a modification of its final elevation design. The region also supports expansions of existing Class 2 landfills through modification of final elevation design. The region does not support any new landfill facilities, except for: Class 1 landfills and non-merchant (non-commercial) Class 2 landfills used solely for the disposal of industrial waste generated by the owner in the course of his manufacturing or industrial operations. Any new transfer stations in the region are allowed if all materials going through the transfer station are to be sent to a facility owned and operated by TRSWA or the counties.

The member counties and TRSWA will follow procedures outlined by the South Carolina Department of Health and Environmental Control (SCDHEC) for determining "need" and "consistency." SCDHEC will determine "need" according to regulatory requirements that specify the maximum number of facilities that can be located within a certain geographical proximity to one another and according to the state and regional plans. SCDHEC's determinations will be mailed to the Authority's General Manager, in writing, with a copy mailed to the Chairman of the Board of Directors and a copy mailed to the County Administrator in the county in which the facility is proposed. Three Rivers Solid Waste Authority will have fifteen (15) days after receipt of SCDHEC preliminary determination to respond in writing to SCDHEC. If TRSWA determines that a proposed facility is inconsistent with its Plan, TRSWA must document the reasons for disagreement with the DHEC determination, in writing, to SCDHEC, and the reasons must be based on the Regional Plan or local ordinances. TRSWA will make its decisions based on the content of this Regional Solid Waste Management Plan, ongoing changes in laws and regulations, as well as local ordinances.

Prior to the Consistency determination, the applicant must demonstrate the "need" for the proposed facility according to Regulation 61-107.17. The term "Need," as it relates to this regulation, is not an endorsement from SCDHEC as to actual need, which is determined by local governments and supported by the written Solid Waste Management Plan in effect for the local governments at the time. A "demonstration of need" pursuant to this regulation is tantamount to a determination that the facility would be appropriate from a regulatory perspective based on a



number of criteria including spatial and volumetric calculations relative to similar facilities, subject to consistency determination. The proposed facility or expansion must also be consistent with the state solid waste management plan.

Any new or existing solid waste management facility must comply with local standards including but not limited to zoning, land use, and other local ordinances. TRSWA will amend its Solid Waste Management Plan to include a new or expanded facility only after a permit has been issued.

TRSWA has the authority to revoke its endorsement of a "Letter of Consistency" if the permit application contains a material misrepresentation of fact, is inaccurate, or is not representative of the request for the "Letter of Consistency".

Each member county has passed appropriate resolutions giving full planning responsibility to the Authority, subject to approval by the individual counties. Any changes, modifications, amendments, or revisions to this Plan will be made by the Three Rivers Solid Waste Authority Board of Directors, with approval from the member counties.

Each member county is responsible for making Annual Progress reports to SCDHEC. TRSWA will review and monitor these reports and work with the counties to implement programs designed to improve the quality of services delivered to the region's citizens, consistent with this Plan.

This "Solid Waste Management Plan" is dated November 4, 2009. It has been reviewed and approved by the elected officials of each County Council, the Regional Solid Waste Advisory Committee (SWAC), the TRSWA Technical Advisory Committee (TAC), and the regional Public Works/Solid Waste managers. It has been reviewed and adopted by the TRSWA Board of Directors. Each county has enacted a Resolution approving the Plan on behalf of the county. The counties have communicated with the municipalities within their boundaries to ensure that all programs are consistent and coordinated. Three Rivers staff has also met with municipal representatives from time to time for coordination and to receive input for the Regional Plan. Municipalities have been surveyed and are included in this Plan. Businesses have also been surveyed, and the counties and the Authority and the counties actively work with businesses to promote activities that are consistent with this Plan.

Plan revisions, modifications, amendments, and changes must be approved in the same manner as outlined above for the Regional Plan. Such changes may be enacted at any time.

\*\*When evaluating the data presented in this Plan, it should be noted that calculations such as "Tonnage per capita" or "Cost per capita" should be evaluated with the understanding that population figures are estimated based on most recent data.



## **2.0 LEGAL AUTHORITY**

Management of non-hazardous solid wastes in South Carolina is governed by a comprehensive state law on solid waste management, the South Carolina Solid Waste Policy and Management Act of 1991 (the Act) and the regulations enacted pursuant to the Act. This statute was signed into law by Governor Campbell on May 27, 1991.

The South Carolina Solid Waste Policy and Management Act (SCSWPMA) was passed in response to Subtitle D of the federal Resource Conservation and Recovery Act (RCRA). Subtitle D is the section of RCRA that addresses the management of non-hazardous solid wastes. Subtitle D regulations continue to recognize solid waste management as primarily a state and local function. Consequently, EPA will rely on states to implement the new federal standards by incorporating these standards into their state solid waste programs. States must apply for EPA approval of their programs. State regulations must at least be consistent with Subtitle D regulations, but they may be more stringent than federal requirements.

Section 44-96-290(G) of the Solid Waste Policy and Management Act states that no permit to construct or expand a solid waste management facility may be issued unless the proposed facility or expansion is consistent with the local or regional solid waste management plan.

### **2.1 South Carolina Solid Waste Policy and Management Act of 1991**

The Act is divided into two major articles. Article 1 is the policy and planning section of the law. It also addresses management of certain specific waste streams, such as waste tires, used oil, and lead-acid batteries. Article 2 of the Act is the regulatory component of the law, establishing, among other things, stricter new minimum standards for solid waste landfills and incinerators. The Act also contains several separate provisions that are not a part of Article 1 or 2, most significantly increased penalties for littering.

#### **2.1.1 Article 1**

In order to promote proper solid waste management, the Act establishes several statewide policies that are of significance to this Plan. First, the Act states a policy of the reduction of waste at the source of generation and recycling and reuse of materials prior to either incineration or landfilling. Thus, while the Act recognizes that properly designed and operated landfills will always be necessary, it calls on local governments to try to divert recoverable materials from landfills by establishing comprehensive waste management systems involving recycling and reduction efforts.

Another significant state policy is support for regionalization. The Act does not mandate that counties join together to form regions, but its provisions make it unmistakably clear that regionalization is the preference of the General Assembly. Recognizing the significant economies of scale and other benefits that would result from

joint efforts, the legislature attempted to guide local governments in that direction by specifically establishing regionalization as a state policy and directing SCDHEC to make every effort to encourage that approach.

To help implement these policies, the Act established a statewide goal to reduce the amount of solid waste being received at municipal solid waste landfills and incinerators by 30% within 6 years of enactment. This reduction goal is measured based on the FY 1993 solid waste generation level, calculated by weight. The Act also established a recycling goal of 25% of the total solid waste in this State within 6 years after enactment. Those goals have been revised, along with the definition for recycling, and current goals are 35% for recycling and 3.5 pounds per person per day for disposal.

In Section 44-96-20 (B), the Act outlines its purpose as the following:

- to protect the public health and safety, protect and preserve the environment of the State and recover resources that have the potential for further usefulness by providing for, in the most environmentally safe, economically feasible and cost-effective manner, the storage, collection, transport, separation, treatment, processing, recycling and disposal of solid waste;
- to establish and maintain a cooperative state program for providing planning assistance, technical assistance, and financial assistance to local governments for solid waste management;
- to require local governments to adequately plan for and provide efficient, environmentally acceptable solid waste management services and programs;
- to promote the establishment of resource recovery systems that preserve and enhance the quality of air, water and land resources;
- to ensure that solid waste is transported, stored, treated, processed and disposed of in a manner adequate to protect human health, safety, welfare and the environment;
- to promote the reduction, recycling, reuse and treatment of solid waste and the recycling of materials that would otherwise be disposed of as solid waste;
- to encourage local governments to utilize all means reasonably available to promote efficient and proper methods of managing solid waste, which may include contracting with private entities to provide management services or operate management facilities on behalf of the local government, when it is cost effective to do so;
- to promote the education of the general public and the training of solid waste professionals to reduce the generation of solid waste, to ensure proper disposal of

solid waste and to encourage recycling;

- to encourage the development of waste reduction and recycling programs through planning assistance, technical assistance, grants and other incentives;
- to encourage the development of the state's recycling industries by promoting the successful development of markets for recycled items and by promoting the acceleration and advancement of the technology used in manufacturing processes that use recycled items;
- to establish a leadership role for the State in recycling efforts by requiring the General Assembly, the Governor's Office, the Judiciary and all state agencies to separate solid waste for recycling and by granting a preference in state procurement policies to products with recycled content;
- to require counties to develop and implement source separation, resource recovery or recycling programs or all of the above, or enhance existing programs so that valuable materials may be returned to productive use, energy and natural resources conserved and the useful life of solid waste management facilities extended;
- to require local governments and state agencies to determine the full cost of providing storage, collection, transport, separation, treatment, recycling and disposal of solid waste in an environmentally safe manner; and
- to encourage local governments to pursue a regional approach to solid waste management.

The Act requires DHEC to submit a solid waste management plan to the Governor and to the General Assembly at intervals no greater than five years. This plan will essentially serve as a "blueprint" for solid waste management activities in this State for the next 20 years. The State Plan must include, among other things, inventories of the type of solid waste currently being received at solid waste disposal facilities in the State, estimates of types of solid waste that will be disposed of in the State for the next 20 years, a description of means by which the State will achieve its solid waste reduction and recycling goals, and a description of the public education programs to be developed. As required by the Act, a statewide Solid Waste Advisory Council (SWAC) was established to advise DHEC on the preparation and implementation of the State Plan. This Council also approves grant awards to local governments. The members of the Advisory Council include representatives from manufacturing interests, the retail industry, the general public, the Governor's Office, DHEC, and counties of varying populations.

After submitting the plan to the Governor and to the General Assembly, DHEC will issue an annual report or "report card" on efforts to manage solid waste during the

previous year. This report will include any revisions that are necessary in the State Plan and a description and evaluation of the progress made by local governments in implementing their own solid waste management plans.

Counties or regions, which must include the participation of municipalities therein, must also submit local solid waste management plans to DHEC. The local plans must be consistent with the State Plan. The local plans must also provide for implementation of a recycling program within the county or region and an education program for local citizens. Since the demographics vary from county to county, however, flexibility is allowed within the county or regional plans. The type of recycling program (curbside, drop-off centers, etc.) is not specified, nor is the selection of materials to be recycled (glass, plastics, paper, etc.).

The Act provides that the governing body of a county has the ultimate responsibility and authority to provide for the operation of solid waste management facilities within the incorporated and unincorporated areas of the county. The counties may jointly or individually form regional governments or other legal entities which have certain responsibilities and authorities.

The Act places a strong emphasis on recycling by requiring all counties and regions to implement some type of recycling program. Recycling is impractical and economically infeasible if there is no market for the separated or recycled materials. To address this problem, the Act creates a Recycling Market Development Advisory Council (RMDAC) within the State Development Board to assist local governments in identifying and developing markets for recycled goods. The Council is a 14-member body that has been appointed by the Governor and includes representation from a number of businesses and industries with an interest in recycling.

The Act further establishes an Office of Solid Waste Reduction and Recycling within DHEC to manage the Solid Waste Trust Fund and the Solid Waste Grant Program. This non-regulatory office has been created and is now carrying out its statutory functions. The Solid Waste Management Trust Fund consists of funds generated by fees, any funds appropriated by the General Assembly, and funds from other sources, such as federal oil overcharge money. The Trust Fund is also authorized to accept donations from private sources. Such funds will be used to fund research, public education programs, and grants to local governments to carry out their responsibilities under the Act.

The fees imposed by the Act as of November 1, 1991, consist primarily of additional charges on the sale of specific items. These items include new tires (\$2.00 per tire, with \$1.50 going to the counties), lead-acid batteries (\$2.00 per battery), "white goods" (\$2.00 per appliance), and motor oil (8¢ a gallon).

The SCDHEC grant program utilizes the funds within the Solid Waste Management Trust Fund. Counties must submit Annual Progress reports to DHEC in

order to be eligible for grants.

Municipal solid waste as defined by the state of South Carolina is “the combined residential, commercial, institutional/non-profit and industrial packaging/office waste generated. This includes paper, cans, bottles, food scraps, yard trimmings, packaging, and other items. It does not include industrial process waste like scraps and by-products from the manufacturing process, C&D debris, automobile waste, combustion ash, mining waste and sewage sludge as well as hazardous, infectious and radioactive waste.”

The Act has been amended to allow DHEC the ability to establish procedures and promulgate regulations necessary to obtain recycling data.

### **2.1.2 Local Government**

Section 44-96-80(J) of the Act gives the governing body of a county the responsibility and authority to provide for the operation of solid waste management facilities. Section 44-96-80(K) of the Act gives the governing body of a county the authority to enact such ordinances that may be necessary to carry out its responsibilities regarding solid waste management. Under this authority, the member counties of TRSWA enacted ordinances to institute local control over solid waste management in their areas, creating Three Rivers Solid Waste Authority as a “joint agency” to serve as the Planning agency for developing and coordinating solid waste management policies in the region. The Authority’s policies are subject to approval by the counties.

### **2.1.3 Article 2**

As indicated above, Article 2 is the regulatory component of the Act. It provides for the permitting and regulation of all types of solid waste management facilities.

Other significant aspects of Article 2 include establishment of a training program and certification requirement for operators of solid waste management facilities. The Act also creates a “facility issues negotiation process” whereby local citizens can appoint a citizens’ committee to negotiate with a permit applicant, public or private, for a municipal solid waste disposal facility on issues such as hours of operation, property values, traffic routing, etc.

## **2.2 Amendments and Regulations**

In addition to the MSW landfill regulations, the Act requires DHEC to establish regulations regarding other types of solid waste management. From 1993 through 2009, the following regulations were promulgated:

A complete list and brief description of each regulation promulgated as required by the Act follows:

- R.61-107.1     Solid Waste Management Grants, Recycling Education Grants, and Waste Tire Grants.  
This regulation establishes procedures for disbursement of solid waste management grants, recycling education grants, and waste tire grants to local government or regions for solid waste management and recycling education. The regulation became effective on April 23, 1993.
- R.61-107.2     Full Cost Disclosure.  
This regulation establishes the method for local governments to use in calculating the full cost for solid waste management within the service area of the local government. The regulation sets deadlines for publication of full cost figures in a newspaper of general circulation in the service area, and gives a deadline for reporting to DHEC. The regulation directs persons under contract to dispose of solid waste to assist the local government in providing full cost figures. The regulation became effective on April 23, 1993.
- R.61-107.3     Waste Tires.  
This regulation establishes a comprehensive program to regulate waste tire haulers, collectors, processors and disposal facilities. The regulation requires registration of waste tire haulers and permitting of waste tire processors, collectors and disposal facilities. Disposal of whole waste tires in municipal solid waste landfills was prohibited October 23, 1993. The regulation became effective on April 23, 1993.
- R.61-107.4     Yard Trash and Land-Clearing Debris; and Compost.  
This regulation establishes requirements that will ensure proper management or disposal, or both, of yard trash and land-clearing debris. This regulation applies to composting facilities using yard trash and land-clearing debris and wood chipping facilities that chip untreated wood waste. Yard Trash was banned from municipal solid waste landfills effective May 27, 1993. The regulation became effective on April 23, 1993.
- R.61-107.5     Collection, Temporary Storage, and Transportation of Municipal Solid Waste.  
This regulation establishes the minimum standards for the collection, temporary storage, and Transportation of solid waste prior to processing, disposal, etc. of that waste. This regulation applies to any person who collects, temporarily stores, and/or Transports solid waste from residences, businesses, and/or industrial sites. The regulation became effective on May 28, 1993.
- R.61-107.6     Solid Waste Processing Facilities.  
This regulation establishes the minimum standards for the proper operation and management of facilities that receive solid waste for processing. The regulation requires permitting of solid waste processing facilities. The regulation became effective on May 28, 1993 and was amended June 23, 1995. The amendment makes the regulation applicable to all facilities that process solid wastes, except



for on-site processing of solid waste generated in the course of normal operations on property under the same ownership or control as the processing facility. The amendment also: requires all tipping areas to be covered or enclosed; includes new closure requirements; requires the posting of signs indicating the hours of operation; and, deletes the Demonstration of Need Language.

R.61-107.7     Transfer of Solid Waste.

This regulation establishes the minimum standards for facilities where solid waste is transferred from collection vehicles to other Transportation units for movement to another solid waste management facility prior to its processing and disposal. The regulation became effective on May 28, 1993.

R.61-107.8     Lead-Acid Batteries.

This regulation establishes the minimum standards for the proper disposal, collection, and recycling of lead-acid batteries. The regulation requires registration of lead-acid battery collection, recycling and recovered material processing facilities. Disposal of lead-acid batteries in municipal solid waste landfills was prohibited on May 27, 1992. The regulation became effective June 25, 1993 and was amended on June 23, 1995. The amendment prohibits incineration and disposal of small sealed lead-acid batteries in landfills. The amendment outlines requirements regarding the proper management and disposal of these batteries. (Small sealed lead-acid batteries weigh less than 25 pounds and are used in laptop computers, camcorders, emergency lighting, portable telephones, etc.)

R.61-107.9     White Goods.

This regulation establishes the minimum standards for the proper management or disposal of inoperative or discarded white goods. Disposal of white goods in municipal solid waste landfills was prohibited on May 27, 1994. The regulation became effective on June 25, 1993.

R.61-107.10     Research, Development and Demonstration Permit Criteria.

This regulation establishes the minimum standards for the proper operation and management of solid waste management facilities, proposing to utilize an innovative and experimental solid waste management technology or process. The regulation became effective on June 25, 1993.

R.61-107.12     Solid Waste Incineration and Solid Waste Pyrolysis Facilities.

This regulation establishes the procedures, documentation, and other requirements that must be met for the proper operation and management of all municipal solid waste incineration facilities, including all municipal solid waste pyrolysis facilities, and waste-to-energy facilities burning municipal solid waste for energy recovery. This regulation became effective May 28, 1999, and replaces the regulation of July 23, 1993. The regulation removes the moratorium on solid waste incinerators and pyrolysis facilities, but retains the limitation of 600 tons

per day per facility, as required in the Act, for any facilities placed in service after 1991.

Solid Waste Incinerators and Pyrolysis facilities must also receive permits consistent with R.61-62.5 from the Bureau of Air for Standard No.3 for Waste Combustion and Reduction. More restrictive requirements may also apply under federal New Source Performance Standards (NSPS), National Standards for Hazardous Air Pollutants (NESHAP), federal or state Prevention of Significant Deterioration (PSD) regulations, and Hazardous Waste Management regulations.

R.61-107.13 Municipal Solid Waste Incinerator Ash Landfills.

This regulation establishes minimum criteria for siting, design, construction and operation of municipal solid waste incinerator ash landfill units. The regulation became effective on May 27, 1994.

R.61-107.14 Municipal Solid Waste Landfill Operator's Certification.

This regulation establishes minimum training and certification requirements for operators of municipal solid waste landfills and municipal solid waste incinerator ash landfills. This regulation became effective on May 27, 1994.

R.61-107.15 Land Application of Solid Waste.

This regulation establishes appropriate application rates, frequency of application, and monitoring requirements for the uniform surface spreading or mechanical incorporation of non-hazardous solid waste on, or into, soil for beneficial agricultural, silvicultural and horticultural purposes. This regulation does not allow land application as a means of disposal. This regulation became effective on July 26, 1996.

R.61-107.17 Demonstration of Need.

This regulation establishes criteria for demonstration of need (DON) for new or expanding facilities. Among other things, it establishes a "planning area" that is used to determine whether a proposed or expanding facility is located geographically so as to avoid the proliferation of unnecessary new or expanded facilities. This regulation does not address consistency, so actual need must be determined by combining DON with the state and local or regional Plan. This regulation became effective on June 26, 2009.

R.61-107.19 Solid Waste Management: Solid Waste Landfills and Structural Fill Landfills.

This regulation establishes the minimum standards for siting, design, construction, and operations of landfills receiving non-hazardous solid and municipal waste. The regulation contains lists (Appendices) of acceptable material allowed in three types of landfills. Landfills are designated as Class 1, Class 2, or Class 3 landfills according to the type waste accepted. The regulation outlines different design criteria for the different types of landfills, depending on the waste-type accepted. This regulation became effective on May 23, 2008.

This new regulation replaces four previous regulations (R.61-107-11, R.61-107.13, R.61-107.16, and R.61-107.258). It improves solid waste management in four key ways:

1. Directs disposal based on characteristics of waste instead of source of generation.
2. Provides better protection of the environment and public health.
3. Facilitates public notification and input for permits: and
4. Requires registration of all structural fill activities.

Landfill classification changes are as follows:

<u>OLD CLASSIFICATION</u>	<u>NEW CLASSIFICATION</u>
Land-clearing Debris landfill	Class 1 Landfill
Construction and Demolition Landfill	Class 2 Landfill
Industrial Class 1 Landfill	Class 2 Landfill
Municipal Solid Waste Landfill	Class 3 Landfill
Industrial Class II Landfill	Class 3 Landfill
Industrial Class III Landfill	Class 3 Landfill

#### R.61-107.259 Used Oil.

This regulation establishes the minimum standards for the proper management of used oil generated in the State. The regulation contains standards for used oil generators, collection refiners, and burners. The regulation also addresses the disposal of used oil and used oil filters. The regulation is consistent with the EPA Used Oil Regulation. The regulation became effective on July 18, 1995.

More information can be found at [www.scdhec.gov/environmental/lwm/html/solidwaste](http://www.scdhec.gov/environmental/lwm/html/solidwaste) regulations.

## **2.3 Local Government**

### **2.3.1 Aiken County**

Responsibility for solid waste management in Aiken County falls under the Office of Public Works and Engineering. Under the Director of Public Works and Engineering, a Solid Waste Supervisor is responsible for litter control, the Wagener C&D landfill, the Barden C&D landfill, drop-off centers, a recovered materials baling operation (RMBO) at the Barden site, and transportation of wastes and recyclables.

Rates for services provided by the county are approved annually in the county budget. If there is no provision in the current budget, rates from the previous year apply, unless a resolution or ordinance passed by Council establishes new rates during the course of the year. The most recent budget ordinance was effective July 1, 2009.

Chapter 10 of the County Code of Laws covers all aspects of the regulations affecting solid waste, including fines.

There is a \$20 per ton charge applied to commercial and industrial MSW brought to the regional landfill by commercial haulers who do not have a county- approved recycling program, pursuant to ordinance 97-6-30, effective July 1, 1997. The county maintains a list of commercial haulers who are approved for hauling residential waste to the regional landfill at no charge. The county does not charge residents or businesses that deliver clean, segregated recyclables to the Barden RMBO. The county maintains a list of materials that are approved for disposal, with corresponding disposal rates, and only residential MSW from approved haulers can be disposed at no charge.

Aiken County manages ten (10) staffed Drop-Off sites. For hours and operating information, telephone 803-642-1533. A link to the Aiken County site can be found at [www.trswa.org](http://www.trswa.org).

### **2.3.2 Allendale County**

The day-to-day responsibility for solid waste management in Allendale County falls under the direction of Director of Public Works, who reports to the county administrator.

Allendale County collects its municipal solid waste (MSW) at the county's three (3) convenience centers and fifteen (15) green box sites. Private citizens also have the option of utilizing various private curbside collectors. Allendale County does not have any landfills or transfer stations, and C&D wastes that are controlled by the county are directed to the Barnwell County C&D landfill. Commercial waste is picked up by private haulers and generally goes to either the Three Rivers Regional Subtitle D Landfill or to the Hickory Hill Subtitle D landfill in Jasper County.

In a letter from Allendale County Council to Three Rivers Solid Waste Authority, dated August 11, 2006, Allendale County stated that "there is a tremendous need for a C&D Landfill in Allendale County" and requested that the Authority take steps to support the application for a new landfill in Allendale County. The Authority has endorsed the construction and operations of a new, Class 2 landfill in Appleton.

Allendale County Council funds its costs associated with management and disposal of solid wastes, including operating its convenience centers, through the collection of property taxes assessed against all improved residential, commercial, and industrial properties. Beyond payment of this tax, the County does not assess further charges on citizens for the disposal of their regular MSW

Ordinance number 03-111, enacted July 17, 2003, sets forth policies governing the disposition of Allendale County's solid waste. It also addresses new or expanding facilities proposed for the county.

Green-box sites are always open. Convenience Centers are open as follows: Monday; Tuesday; Wednesday Closed; Thursday; Friday; Saturday; Sunday Closed. Materials recycled include: Plastics (milk jugs, 2 liter bottles, cleaning product containers only); aluminum; newspaper; white goods; used oil; tires. Recyclables are taken to the Barnwell RMBO.

Items not accepted include: antifreeze, asbestos, cleaning fluids, gasoline, any free-flowing liquids such as paint, paint thinners and solvents, tars, glue, sheetrock, any hazardous waste, medical wastes, and orange DOT cleanup bags (that are handled by SCDOT.)

For more information, call Allendale County at 803-584-3438.

### **2.3.3 Bamberg County**

The day-to-day responsibility for solid waste management in Bamberg County falls under the direction of the Solid Waste Director, who reports to the county administrator.

Bamberg County processes its municipal solid waste (MSW) and commercial waste through its transfer station located off Cox Street, 3 miles outside of Bamberg. From that point, the Three Rivers Solid Waste Authority transports the MSW to its "Subtitle D" landfill located at the Savannah River Site. Household waste is collected both at the county's eight convenience centers and through various private curbside collectors. Citizens and other customers transport their construction and demolition (C&D) waste to the County C&D Landfill off Cox Street, 3 miles outside of Bamberg.

Bamberg County Council funds its costs associated with management and disposal of solid wastes, including operating its convenience centers, through the collection of property taxes assessed against all improved residential, commercial, and industrial properties. Beyond payment of this tax, the County does not assess further charges on citizens for the disposal of their regular MSW. Businesses, however, are assessed the solid waste fee and charged for disposal on a per-ton basis.

Ordinance number 6-03-4, enacted June 28, 2004, sets forth policies governing the disposal of Bamberg County's solid waste.

As of November 4, 2009, Convenience Centers are open as follows: Monday 7 to 7; Tuesday Closed; Wednesday Open 7 to 7; Thursday Closed; Friday Open 7 to 7; Saturday Open 8 to 4; Sunday Closed. Materials recycled include: OCC, newspapers, aluminum, white goods, scrap metal, waste tires, used oil, oil/gas mixture, automobile, batteries, and PET & HDPE plastics. Recyclables are taken to the Barnwell County RMBO. For updated information, call Bamberg County or visit [www.trswa.org](http://www.trswa.org) and go to the Bamberg County link.

Items not accepted include: antifreeze, asbestos, cleaning fluids, gasoline, any free-flowing liquids such as paint, paint thinners and solvents, tars, glue, sheetrock, any hazardous waste, medical wastes, and orange DOT cleanup bags (that are handled by SCDOT.)

For more information, call the Solid Waste Director in Bamberg County at 803-245-5191 or call the Bamberg County Administrator at 803-245-5191.

#### **2.3.4 Barnwell County**

Responsibility for solid waste management in Barnwell County falls under the Office of Engineering. Under the Director of Engineering, a Solid Waste Supervisor is responsible for the county Class 2 landfill, nine convenience centers (drop-off sites), a Materials Recovery Facility (MRF) located at the landfill site, a transfer station, and transportation of wastes and recyclables.

Rates for services provided by the county are approved annually in the county budget. If there is no provision in the current budget, rates from the previous year apply, unless a resolution or ordinance passed by Council establishes new rates during the course of the year. The most recent rate information is contained in Resolution 2006-55, effective January 3, 2006, including rates for out-of-county wastes. The county approves a new budget each fiscal year, which begins July 1.

No commercial wastes are accepted at the convenience centers, and a charge of \$27.50 per ton applies at the county Class 2 landfill for acceptable waste materials. MSW is delivered to the transfer station at a charge of \$38.50 per ton. Recoverable/recyclable materials from business and commercial generators can be delivered to the MRF at the landfill site at no charge if those materials are clean and separated according to commodity type. The MRF is centrally located in the county.

The county manages nine (9) convenience centers. As of November 4, 2009, these sites are open from 7 am to 7 pm on Monday, Wednesday, and Saturday of each week. At the sites, individuals place recyclable materials into separate bins. The county collects aluminum, steel cans, newspaper, cardboard, tires, and mixed plastics (numbers 1-7). Clear, brown, and colored glass is collected in specially constructed bins, as is scrap steel/used appliances (white goods). The following materials are also collected and recycled: automobile batteries, oil filters, oil bottles, plastic bags, electronic wastes, cooking oil, tires on rims, textiles, used paints, and anti-freeze.

Barnwell County process its municipal solid waste (MSW) and commercial waste through its transfer station located at the Class 2 landfill off Reynolds Road, 5 miles north of Barnwell. From that point, Three Rivers Solid Waste Authority transports the MSW to its Class 3 landfill on the Savannah River Site. Household waste is collected at the 9 convenience centers and through various private curbside collectors. Citizens and other

customers transport their construction and demolition (C&D) waste and land-clearing debris to the Barnwell County Class 2 landfill.

For more information, telephone the Barnwell County Administrator at 803-541-1000, or call the Solid Waste Supervisor at 803-541-1109. A link to the Barnwell County site can be found at [www.trswa.org](http://www.trswa.org).

### **2.3.5 Calhoun County**

Responsibility for solid waste management in Calhoun County falls under the Public Works Department. Under the Director of Public Works, a Solid Waste Supervisor is responsible for the county Class 2 landfill, drop-off centers, and transportation of wastes and recyclables.

Rates for services provided by the county are approved annually in the county budget. If there is no provision in the current budget, rates from the previous year apply, unless a resolution or ordinance passed by Council establishes new rates during the course of the year. The most recent rate information is contained in Ordinance 2002-4, effective February 24, 2003. The county approves a new budget each fiscal year, which begins July 1. Ordinance 2002-4 covers all aspects of the regulations affecting solid waste. Among the provisions of the ordinance, it is stipulated that residents may bring no more than 4 passenger tires per year, per household, for disposal at no charge. Only waste generated in Calhoun County or deposited by Calhoun County residents will be accepted at the landfill or drop-off centers.

Calhoun County manages nine (9) Drop-Off sites. Each residence can deliver up to four tires per year at no charge to a Drop-Off site. Residents may deliver used appliances (white goods) at no charge. Used oil and automobile batteries are accepted from residents. The county has one mixed gas/oil recycling tank at the county landfill, and there is no charge for accepting this material. No commercial wastes are accepted at the Drop-Off sites, and a charge applies at the county Class 2 landfill for acceptable waste materials. Recoverable/recyclable materials from business and commercial generators can be delivered to Drop-Off sites if those materials are clean and separated according to commodity type.

Calhoun County utilizes the Orangeburg County transfer station for its Subtitle D wastes. The county also works with Orangeburg County to process some of its recyclables.

For more information, telephone 803-874-2435. A link to the Calhoun County site can be found at [www.trswa.org](http://www.trswa.org).

### **2.3.6 Edgefield County**

The day-to-day responsibility for solid waste management in Edgefield County falls under the direction of the county administrator. The county administrator works in conjunction with the Tri County Solid Waste Authority, whose six-member board of commissioners appoints a director. The three member counties (Edgefield, McCormick, and Saluda), through their respective county councils, appoint two members each to the Board. This Board of Commissioners is the policy-making body for all matters concerning the Authority and solid waste matters affecting the three counties jointly. The member counties make their own, individual policies concerning in-county disposal and the funding of solid waste activities.

Edgefield County processes its municipal solid waste (MSW) and commercial waste through the Tri County Solid Waste Authority's transfer station in Johnston. From that point, the Three Rivers Solid Waste Authority transports the MSW to its "Subtitle D" landfill located at the Savannah River Site. Household waste is collected both at the county's eight household solid waste convenience centers and through various private curbside collectors. Citizens and other customers transport their construction and demolition (C&D) waste to the Tri County C&D Landfill on Hwy. 378 in Edgefield County or to private Class 2 landfills in and out the county. This landfill will close on May 23, 2010.

Edgefield County Council funds its pro-rata portion of the Tri County Solid Waste Authority's budget, along with the costs associated with operating its convenience centers, through a solid waste fee assessed against waste-generating structures (i.e., households, businesses, and other structures connected to public utilities). Beyond payment of this fee, the County does not assess further charges on citizens for the disposal of their regular MSW. Businesses, however, are assessed the solid waste fee and charged for disposal on a per-ton basis.

Chapter 51 of The Edgefield County Code of Ordinances sets forth policies governing the disposal of Edgefield County's solid waste. Interested persons may view this information on line at [http://www.amlegal.com/edgefield\\_county\\_sc](http://www.amlegal.com/edgefield_county_sc), or in bound form at the County's administration building located at 124 Courthouse Square in Edgefield.

Tri-County Solid Waste Authority collects MSW and recyclables from eight (8) convenience centers in Edgefield County. Materials recycled include: OCC, newspaper, aluminum, white goods, scrap metal, waste tires, used oil, oil/gas mixture, automobile batteries, and pet & hdpe plastics. The OCC, newspaper, aluminum, and plastics are processed at the Tri-County RMBO.

No commercial wastes are accepted at the Drop-Off sites. Commercial MSW can be delivered to the transfer station. Recoverable/recyclable materials from business and



commercial generators can be delivered to Drop-Off sites or to the RMBO at no charge if those materials are clean and separated according to commodity type.

For more information, call Tri-County Solid Waste Authority at 803-275-5345. A link to the Tri-County site can be found at [www.trswa.org](http://www.trswa.org).

### **2.3.7 McCormick County**

The day-to-day responsibility for solid waste management in McCormick County falls under the direction of the county administrator. The county administrator works in conjunction with the Tri County Solid Waste Authority, whose six-member board of commissioners appoints a director. The three member counties (Edgefield, McCormick, and Saluda), through their respective county councils, appoint two members each to the board. This board of commissioners is the policy-making body for all matters concerning the Authority and solid waste matters affecting the three counties jointly. The member counties make their own, individual policies concerning in-county disposal and the funding of solid waste activities.

McCormick County processes its municipal solid waste (MSW) and commercial waste through the Tri County Solid Waste Authority's transfer station in Johnston. From that point, the Three Rivers Solid Waste Authority transports the MSW to its "Subtitle D" landfill located at the Savannah River Site. Household waste is collected both at the county's eight household solid waste convenience centers and through various private curbside collectors. Citizens and other customers transport their construction and demolition (C&D) waste to the Tri County C&D Landfill on Hwy. 378 in Edgefield County or to private Class 2 landfills in and out the county. This landfill will close on May 23, 2010.

McCormick County Council funds its pro-rata portion of the Tri County Solid Waste Authority's budget, along with the costs associated with operating its convenience centers, through its property taxes. Beyond payment of this fee, the County does not assess further charges on citizens for the disposal of their regular MSW.

Tri-County Solid Waste Authority collects MSW and recyclables from four (4) convenience centers in McCormick County. Materials recycled include: OCC, newspaper, aluminum, white goods, scrap metal, waste tires, used oil, oil/gas mixture, automobile batteries, and PET & HDPE plastics.

No commercial wastes are accepted at the Drop-Off sites. Commercial MSW can be delivered to the transfer station in Edgefield County. Recoverable/recyclable materials from business and commercial generators can be delivered to Drop-Off sites or to the RMBO in Edgefield County at no charge if those materials are clean and separated according to commodity type. There are also several locations where small 8 cubic yard containers are placed as receptacles for cardboard from businesses.

For more information, call McCormick County at 864-465-2231 or call Tri-County Solid Waste Authority at 803-275-5345. A link to the Tri-County site can be found at [www.trswa.org](http://www.trswa.org).

### **2.3.8 Orangeburg County**

The day-to-day responsibility for solid waste management in Orangeburg County falls under the direction of the Solid Waste Manager, who reports to the Deputy County Administrator of Public Services. The County is responsible for a Class 2 Landfill, transfer Station, and 21 Convenience Sites in addition to the maintenance and monitoring of a closed MSW Landfill. Orangeburg County processes its municipal solid waste (MSW) and commercial waste through its transfer station located off Frontage Road, southeast of the intersection of U.S. Highway 601 and Interstate 26. Orangeburg County Council is the policy-making body for all matters concerning solid waste matters and currently operates under County Ordinances, Section 34-1 through 34-9. Orangeburg County is a charter member of the Three Rivers Solid Waste Authority.

Orangeburg County processes its municipal solid waste (MSW) and commercial waste through the Orangeburg County transfer station. The Orangeburg County transfer Station also serves as a local drop point for Calhoun County's MSW. From that point, the Three Rivers Solid Waste Authority transports the MSW to its "Subtitle D" landfill located at the Savannah River Site. Household waste is collected both at the county's twenty-one household solid waste convenience centers and through various private curbside collectors. Citizens and other customers transport their construction and demolition (C&D) waste to the Orangeburg County Class 2 Landfill at the same location.

Orangeburg County Council funds its costs associated with management and disposal of solid wastes, including operating its convenience centers, through a solid waste fee assessed against all improved residential, commercial, and industrial properties. Beyond payment of this fee, the County does not assess further charges on citizens for the disposal of their regular MSW. Businesses, however, are assessed the solid waste fee and charged for disposal on a per-ton basis.

Orangeburg County collects MSW and recyclables from twenty-one (21) convenience sites in the county. Sites are open Monday through Saturday, 7:00am-7:00pm; Sunday, 2:00pm-7:00pm. Materials recycled include: OCC, newspaper, aluminum, white goods, scrap metal, waste tires, used oil, oil/gas mixture, automobile batteries, and PET & HDPE plastics. OCC, newspapers, aluminum, and plastics are processed at the RMBO.

Items not accepted include: antifreeze, asbestos, cleaning fluids, gasoline (except at US 301 Santee site), any free-flowing liquids such as paint, paint thinners and solvents, tars, glue, sheetrock, any hazardous waste, and medical wastes.

For more information, call the Solid Waste Manager at 803-308-0810, [prisa@orangeburgcounty.org](mailto:prisa@orangeburgcounty.org), or call or email Earl L. Whalen, Deputy Administrator, 803-533-6164, [ewhalen@orangeburgcounty.org](mailto:ewhalen@orangeburgcounty.org), or call Orangeburg County Solid Waste/Landfill at 803-536-5045. A link to the Orangeburg County site can be found at [www.trswa.org](http://www.trswa.org).

### **2.3.9 Saluda County**

The day-to-day responsibility for solid waste management in Saluda County falls under the direction of the Solid Waste Director, who reports to the county administrator. The county works in conjunction with the Tri County Solid Waste Authority, whose six-member board of commissioners appoints a director. The three member counties (Edgefield, McCormick, and Saluda), through their respective county councils, appoint two members each to the board. This board of commissioners is the policy-making body for all matters concerning the Authority and solid waste matters affecting the three counties jointly. The member counties make their own, individual policies concerning in-county disposal and the funding of solid waste activities.

Saluda County processes its municipal solid waste (MSW) and commercial waste through the Tri County Solid Waste Authority's transfer station in Johnston. From that point, the Three Rivers Solid Waste Authority transports the MSW to its "Subtitle D" landfill located at the Savannah River Site. Household waste is collected both at the county's eight household solid waste convenience centers and through various private curbside collectors. Citizens and other customers transport their construction and demolition (C&D) waste to the Tri County C&D Landfill on Hwy. 378 in Edgefield County or to private Class 2 landfills in and out the county. This landfill will close on May 23, 2010.

Saluda County Council funds its pro-rata portion of the Tri County Solid Waste Authority's budget, along with the costs associated with operating its convenience centers, through ad valorem taxes. Businesses are also charged for disposal on a per-ton basis. Ordinance 6-93, enacted August 30, 1993, sets forth policies governing the disposal of Saluda County's solid waste.

Tri-County Solid Waste Authority collects MSW and recyclables from seven (7) convenience centers in Saluda County. Sites are open as follows: Monday 7 to 7; Tuesday Closed; Wednesday Open 1 to 7; Thursday Closed; Friday Open 1 to 7; Saturday Open 7 to 7; Sunday Open 3 to 7. Materials recycled include: OCC, newspaper, aluminum, white goods, scrap metal, waste tires, used oil, oil/gas mixture, automobile batteries, and PET & HDPE plastics.

Items not accepted include: antifreeze, asbestos, cleaning fluids, gasoline (except at US 378 Traffic Circle site), any free-flowing liquids such as paint, paint thinners and solvents, tars, glue, sheetrock, any hazardous waste, medical wastes, and orange DOT cleanup bags (that are handled by SCDOT.)

No commercial wastes are accepted at the Drop-Off sites. Commercial MSW can be delivered to the transfer station in Edgefield County. Recoverable/recyclable materials from business and commercial generators can be delivered to Drop-Off sites or to the RMBO in Edgefield County at no charge if those materials are clean and separated according to commodity type. There are also several locations where small 8 cubic yard containers are placed as receptacles for cardboard from businesses. For more information, call Tri-County Solid Waste Authority at 803-275-5345. A link to the Tri-County site can be found at [www.trswa.org](http://www.trswa.org).

### **2.3.10 Aiken City (Aiken County)**

The day-to-day responsibility for solid waste management in the city of Aiken falls under the direction of Ms. Sarah Herring, Supervisor II, Solid Waste, who reports to the Assistant Director of Public Works, Mr. Tim Coakley, who reports to the Public Works Director, Mr. Larry Morris.

The city of Aiken offers four (4) services to its residents and businesses: 1) MSW collection, 2) Yard waste pickup, 3) Recycling collection, and 4) commercial MSW collection. These services are governed by the City of Aiken code section 32. Residents are charged \$12.50 per household per month.

The city serves approximately 12,000 households and 450 businesses. In fiscal year 2008, the city disposed of 8916 tons of residential MSW and 8924 tons of commercial MSW. Residential MSW is picked up once per week. Residents are provided roll-out carts. Commercial MSW is picked up from front-loading containers. The MSW is transported directed to the Three Rivers landfill. The city incurs all costs for collection and Transport. Disposal fees are paid by the county.

Yard waste (leaves and limbs) are picked up once a week. The city operates a composting program, and some materials are transferred to the County Class 2 landfill. The city incurs all costs for collection and transport. The county incurs all costs involved with disposal.

Residents are provided with a Recycling bin for pickup of mixed paper, plastics (#1 and #2), glass, tin cans, aluminum, and cardboard. Cardboard is collected from businesses for recycling. These materials are collected by the city and transported to the North Augusta MRF. The city of Aiken pays the city of North Augusta \$25.50 per ton for the material delivered.

Commercial collections are available up to 6 times per week in 4, 6, and 8 cubic yard dumpsters. The city charges according to the dumpster size and the number of collections in a week. The commercial MSW is transported to the Three Rivers landfill.

### **2.3.11 Barnwell City (Barnwell County)**

The city of Barnwell serves 2100 households with curbside collection through a private contractor. The service does not include recycling, but residents are encouraged to take recyclables to the county-operated convenience center. For more information, contact John Zawacki, City Administrator, at 803-259-3266.

### **2.3.12 Town of Blackville (Barnwell County)**

The town of Blackville serves 950 households with curbside collection through a private contractor. The service does not include recycling, but residents are encouraged to take recyclables to the county-operated convenience center. For more information, contact Ed Rockwell, Public Works Director at 803-284-3243.

### **2.3.13 Town of New Ellenton (Aiken County)**

New Ellenton serves 864 households with curbside collection through a private contractor. The service includes recycling, and the town collects approximately 50 tons of recyclables annually.

### **2.3.14 Town of North (Orangeburg County)**

The town of North serves 266 households with curbside collection through a private contractor. The service does not include recycling, but residents are encouraged to take recyclables to the county-operated convenience center.

### **2.3.15 North Augusta City (Aiken County)**

The day-to-day responsibility for solid waste management in the city of North Augusta falls under the direction of the Superintendent of Sanitation Services, Ms. Sonya Lindley, who reports to the Director of Engineering and Public Works, Mr. Tom Zeaser, who reports to the City Manager, Mr. Sam Bennett. North Augusta employs a Code Enforcement Officer, Mr. Mac Westbrook, to enforce all city codes and ordinances, including those associated with sanitation services.

The city of North Augusta offers four (4) services to its residents and businesses: 1) MSW collection, 2) bulky waste collection (including yard waste, scrap metal, cardboard, plastic, tires, appliances, and lumber pickup), 3) recycling collection, and 4) commercial MSW collection. In fiscal year 2008, the city disposed of 8000 tons of residential MSW and 5500 tons of commercial MSW. These services are financed through an enterprise fund where costs are recovered through user charges as set forth in Section 14-123 of the Code of Ordinances. Recycling revenues are used to offset costs. In fiscal year 2008, the city received \$564,349 in recycling revenues.

Residential MSW is picked up once per week. Residents are provided roll-out carts. Residents are given 13 gallon blue bags in which to place recyclables. Blue bags are picked up in the regular roll-out carts along with MSW. The bags are separated at the city's MRF. The MSW is transported directed to the Three Rivers landfill. The city incurs all costs for collection and transport. Disposal fees are paid by the county.

Bulky materials are picked up once a week and transferred to the County Class 2 landfill or to the appropriate recycling facility. The city incurs all costs for collection and transport. The county incurs all costs involved with disposal.

Recycling materials include cardboard, newspaper, mixed paper, plastics (#1 and #2), glass, tin cans, scrap metal, and aluminum. These materials are collected by the city and transported to the North Augusta MRF. Loose recyclables include appliances, tires, used oil, and automobile batteries. Revenues are credited to the city's enterprise fund to offset costs.

The city services approximately 215 commercial accounts. Commercial collections are available up to 6 times per week in 4, 6, and 8 cubic yard dumpsters. The city charges according to the dumpster size and the number of collections in a week. The commercial MSW is transported to the Three Rivers landfill.

#### **2.3.16 Orangeburg City (Orangeburg County)**

The day-to-day responsibility for solid waste management in the city of Orangeburg falls under the direction of Durwood E. Bowden, Public Works Director, who reports to John H. Yow, City Administrator.

The city of Orangeburg offers four (4) services to its residents and businesses: 1) MSW collection, 2) yard waste pickup, 3) recycling collection, and 4) commercial MSW collection. These services are governed by the City of Orangeburg code section 15.

Residential MSW is picked up once per week. Residents are charged \$7.00 per roll cart per household per month. Residents are provided roll-out carts. The MSW is transported directed to the Orangeburg County transfer station. The city incurs all costs for collection and transport. Disposal fees are paid by the county.

Residential yard waste (including leaves and limbs) are picked up once a week and transferred to the Orangeburg County Class 2 landfill. The city incurs all costs for collection and transport. The County incurs all costs involved with disposal.

Residential recycling is accomplished through the following system: Picked up once a week and transported back to the Sanitation Equipment Lot, dumped into a roll-off container emptied by Paper Stock Dealers in Columbia, SC. The city is currently paid between \$15 and \$20 per ton for newspapers.

Commercial collections are available up to 4 times per week in 2, 4, 6, and 8 cubic yard dumpsters. The tipping fee is based on the County disposal rate per ton. The City charges according to the dumpster size and the number of collections in a week. The commercial MSW is transported to the Orangeburg County transfer station where it is transferred to the Three Rivers Regional Subtitle D landfill.

### **2.3.17 Town of Salley (Aiken County)**

The town of Salley serves 197 households with curbside collection through a private contractor. The service includes recycling, and the town collects approximately 10 tons of recyclables annually.

### **2.3.18 Town of Saluda (Saluda County)**

The town of Saluda serves 1,142 households with curbside collection through the town Sanitation department. The town collects approximately 450 tons of recyclables annually, and these recyclables are transported to the North Augusta MRF for processing. Tri-County Solid Waste Authority pays a tip fee to North Augusta for the commingled recyclables. For more information, contact Mr. Randy Cole, Town Administrator, at 864-445-3522.

### **2.3.19 Town of Williston (Barnwell County)**

The town of Williston serves 1,226 households with curbside collection through the town Sanitation Department. The town services around 35 businesses with front-loading dumpsters. The cost of providing these services is covered with collection fees. The service does not include recycling, and the town encourages its residents to take recyclables to the county-operated convenience center. For more information, contact Mr. Scott Neely, Town Administrator, at 803-266-7015.





### 3.0 DEMOGRAPHICS & DESCRIPTION OF REGION

The nine counties that are a part of Three Rivers Solid Waste Authority (TSWRA) are: Aiken, Allendale, Bamberg, Barnwell, Calhoun, Edgefield, McCormick, Orangeburg, and Saluda.

**Aiken County** has a land mass of 702,000 acres and borders the state of Georgia and the Savannah River, and the counties of Edgefield, Saluda, Lexington, Orangeburg, and Barnwell. Approximately 53,000 acres in the southwest corner is occupied by the United States Department of Energy Savannah River Site (DOE-SR). The county demographics are highly diversified, with the western half being urban, and the eastern half being rural. The western half of the county generates around 90% of the county's waste. The population of Aiken County in the Year 2000 census was 142,552, the largest in the Three Rivers region, estimated by the US Census Bureau to be 154,071 in 2009. The projected rate of growth is to exceed the pace of other counties in the region, with growth mostly in the western end. The per capita income well exceeds the mean for the state and the region, and 93.7% of the employment is non-farm.

**Allendale County** is bordered by the State of Georgia at the Savannah River, and the South Carolina counties of Barnwell, Bamberg, and Hampton. The county area is approximately 264,320 acres, and land uses currently are principally agricultural and silvicultural. It is anticipated that the rate of growth will be nominal or negative for the next decade.. Allendale County had a population of 11,211 per the year 2000 census, and the US Census Bureau estimated a population of 10,447 in 2009.

**Bamberg County** has a land mass of approximately 252,800 acres and is bordered by the counties of Allendale, Barnwell, Colleton and Orangeburg. Land uses are, for the most part, agricultural and silvicultural. Year 2000 population of 16,658 is slightly lower than the 1990 census figure. Projections call for the population to hold steady or decline slightly.

**Barnwell County** borders the state of Georgia at the Savannah River, and is bordered by Aiken, Allendale, Bamberg, and Orangeburg Counties. About 132,000 of the 354,000 acres are part of the Savannah River Site. Of the remaining 222,000 acres, about 35% is agricultural, 60% is woodland, and 5% is utilized for urban and industrial/ commercial purposes. Barnwell County's population in year 2000 was 23,478, and population growth is expected to be nominal or negative. Fifty-eight percent of the people live in the towns of Barnwell, Blackville, or Williston, and these towns generate about 85% of the county's solid waste. Transportation routes are generally good around the population centers of the county.

**Calhoun County** has a land mass of 243,500 acres. Land uses are primarily agricultural and silvicultural. The county is bordered by Orangeburg, Lexington, Richland, Sumter, and Clarendon, although there are no transportation routes to the latter two due to water separation of Lake Marion. The population of Calhoun in the year 2000 was 15,185. The county showed the second fastest rate of growth in the region between 1990 and 2000, behind Edgefield County. This rate of growth is expected to continue due to the county's geographical proximity to

Columbia and its recreational amenities associated with Lake Marion.

**Edgefield County** has a land mass of 315,000 acres. About 25% of the county is in Sumter National Forest. The county is bordered by the counties of Aiken, Saluda, McCormick, and Greenwood, and the state of Georgia at the Savannah River. Edgefield County had a population of 24,595 in the year 2000, with 29% of the people living in urban areas. 44.8% of the labor force is employed by manufacturing facilities. Population centers are well-served by good transportation routes. Edgefield County grew by almost 40% between 1990 and 2000, and US Census estimate for 2009 is 25,546. The county's transportation and infrastructure development feed into Aiken and metropolitan Augusta, Georgia.

**McCormick County** has a land mass of 252,000 acres. About 50% of the county is in Sumter National Forest. The county is bordered on the west by the state of Georgia and Lake Strom Thurmond, and elsewhere by Abbeville, Greenwood, and Edgefield counties. McCormick had a population of 9,958 in the year 2000 census, with an estimate of 10,093 for 2009. Forty-two percent (42%) of McCormick's labor force is employed by the government, 31% is in manufacturing, and 10.5% is in services, mostly related to the recreational industry of Lake Strom Thurmond. Much of the employment force works out of the county. The county is bordered on its west side by a system of lakes, most notably, Lake Thurmond. Retirement communities and recreational areas are being developed, and McCormick County should experience an aggressive growth in per capita income over the coming years.

**Orangeburg County** has a land mass of 720,500 acres bordered by the counties of Bamberg, Barnwell, Aiken, Lexington, Calhoun, Clarendon, Berkeley, and Dorchester County. It has the largest geographical area in the region, with the two most distant points in the county being around 70 miles apart. Land uses currently are primarily agricultural and silvicultural; however, land uses around the city of Orangeburg (about 5% of the total area) vary significantly from the rest of the county, with a large number of manufacturing companies. The population of Orangeburg County in the year 2000 was 91,582, with about half of the people living within ten miles of the city of Orangeburg. The county's economy is diversified, similar to that of South Carolina as a whole. The fastest growing economic sector is services, which may be due to an expanding tourist industry in the eastern end of the county. Good transportation routes serve the entire county. US Census Bureau projects population growth to be nominal.

**Saluda County** has a land mass of approximately 295,000 acres. Land uses are primarily agricultural and silvicultural. The county is bordered by the counties of Edgefield, Greenwood, Newberry, Lexington, and Aiken. Saluda County had a population of 19,181 in the year 2000, and growth is projected to be nominal or negative. Twenty percent (20%) of the people live in the county seat of Saluda, and 44% of the labor force work in the manufacturing sector.

POPULATION TRENDS BY COUNTY

Table 3-1

COUNTY	1990	2000	2005	2006	2007	2008	2009	% 1990-2009
Aiken	121,300	142,552	147,488	148,528	150,125	152,333	154,071	27.0
Allendale	11,700	11,211	10,810	10,727	10,546	10,453	10,447	(10.7)
Bamberg	16,900	16,658	15,806	15,727	15,640	15,465	15,307	(9.4)
Barnwell	20,300	23,478	23,047	23,041	22,955	22,961	22,872	12.7
Calhoun	12,800	15,185	14,974	14,862	14,782	14,747	14,583	13.9
Edgefield	18,400	24,595	25,165	25,377	25,133	25,358	25,546	38.8
McCormick	8,900	9,958	9,957	10,003	10,094	10,073	10,093	13.4
Orangeburg	85,000	91,582	90,570	90,704	89,726	90,357	90,336	6.3
Saluda	16,400	19,181	18,556	18,665	18,710	18,692	18,625	13.6
<b>Region Total</b>	<b>311,700</b>	<b>354,400</b>	<b>356,373</b>	<b>357,634</b>	<b>357,711</b>	<b>360,439</b>	<b>361,880</b>	<b>13.7</b>

<http://www.census.gov/popest/counties/counties.html>

PROJECTED POPULATIONS BY COUNTY

Table 3-2

COUNTY	2010	2015	2020	2025	2030
Aiken	160,020	169,820	179,650	189,460	198,860
Allendale	11,050	11,180	11,330	11,460	11,530
Bamberg	15,500	15,110	14,730	14,340	13,800
Barnwell	24,340	25,350	26,360	27,370	28,100
Calhoun	15,870	16,630	17,390	18,150	18,760
Edgefield	27,440	29,360	31,280	33,200	34,630
McCormick	10,700	11,280	11,870	12,460	13,020
Orangeburg	94,740	97,300	99,870	102,440	104,320
Saluda	19,570	20,250	20,920	21,600	22,040
<b>Region Total</b>	<b>379,230</b>	<b>396,280</b>	<b>413,400</b>	<b>430,480</b>	<b>445,060</b>

<http://www.sccommunityprofiles.org/census/proj0035.php>

The following chart ranks the counties according to per capita income, with the average per capita income for the state as a whole shown on the bottom line for comparison.

COMPARISON OF PER CAPITA INCOME\*

Table 3-3

<b>County</b>	<b>1999 Per Capita Annual Income* (2000 U.S. Census)</b>
Aiken	\$18,770
Allendale	\$11,293
Bamberg	\$12,584
Barnwell	\$15,870
Calhoun	\$17,446
Edgefield	\$15,415
McCormick	\$14,770
Orangeburg	\$15,047
Saluda	\$16,328
<b>South Carolina</b>	<b>\$18,795</b>

<http://www.ors2.state.sc.us/abstract/chapter1/countyrank4.php>

## 4.0 WASTE STREAM ASSESSMENT

It is important to have a waste assessment and characterization and general inventory of waste handling and processing capabilities in the region. This assessment is based on a review of annual reports from the counties, plus records maintained by TRSWA and SCDHEC. The categorization allows for analysis of a reuse/recycling program as is necessary for compliance with the 1991 South Carolina Solid Waste Policy and Management Act.

Long-term projections of the waste stream by major category are an important element in evaluating the disposal alternatives. Changes in the quantity of waste generation can be caused by local population trends, land-use policies, the rate of growth in commercial and industrial business activity, and/or the addition/deletion of special waste generators. Projections made in this plan take each of these criteria into consideration. Data was collected from available sources as referenced earlier. Data from all sources was compared and, if different with regards to a specific area, research was conducted to determine the rationale for the difference. This Plan is not only concerned with treatment and disposal options, but also with recommendations for source reduction, which would result in reducing the volume of the waste stream. Changes in composition of the waste stream requiring ultimate disposal would result from changes in the degree and extent of pretreatment (i.e., reuse/recycling) and changes in technology and product packaging. Despite inherent uncertainties, such estimates are essential to permit evaluation of any facilities or systems, present or future.

Waste projections, made to the year 2020 for the applicable categories take into account current waste generation, per capita estimates of waste generation, and estimates of future waste generation. This is based on population and commercial/industrial growth as well as adjustments for reuse/recycling and changes in commercial activity to the extent supported by available data. Based on the resultant waste quantity and composition, TRSWA will have estimates of the amount of waste available for determination of each ultimate treatment alternative.

Recycling activity in the region has been surveyed and assessed for waste characterization, product development, and final use. Geographic location and waste handling capacity of all government-operated separation facilities, processors, packagers, and transporters have been surveyed.

A major remaining solid waste generator addressed in this Plan is the industrial sector, and, though much data has been gathered and analyzed for this sector, it is recognized that not all information is known. Interviews with major manufacturing firms have identified several special waste generation points and options for source reduction, reuse, recycling, waste transformation, or disposal opportunities. In addition to manufacturing firms, there are several large generators of recyclable materials that impact options available for that category. The region feels that the industrial sector, in general, holds the greatest promise for reduction, re-use, and recycling of the largest volume of material overall, thus having the potential to most effectively help the region meet its recycling/diversion goals. This Plan places a moratorium on the construction of new

Class 2 landfills, except for Class 2 landfills that dispose of wastes generated by the owner only in the course of the owner’s industrial operations.

In an effort to tap into this potential, commercial recycling town hall meetings have been held with hundreds of interested parties attending the meetings to gain knowledge of their waste stream. Recycling surveys were sent out to all companies that attended these town hall meetings. We have met and identified several opportunities in the Three Rivers area. According to these surveys, companies in the area need the option to recycle wood, paper, plastic and glass, as well as a few other specialty products. There are currently five RMBOs and one material recovery facility (MRF) in the region. With the current infrastructure in place, the region can expand its industrial recycling service in the region by using the RMBOs as drop off sites and feeding the MRF. All source separated material will be baled and sold at the RMBOs and all co-mingled recyclables will be delivered to the MRF for further separation.

It has also been identified that certain loads being delivered to the transfer station can be diverted to the RMBOs. Several commercial accounts such as distribution centers, manufacturers, and department stores all produce dry waste consisting of wood pallets, plastic stretch film, and cardboard. These loads represent about 8% of total waste going into the transfer site. Diverting these loads will extend the life of the landfill and will have a positive economic impact on the RMBOs. The surveys also identified that the industrial sector would be willing to expand their recycling efforts and would cover the cost of freight if the tipping fees were reduced for recyclable material. Combined with the current residential and commercial recycling potential and utilizing the current infrastructure’s “hub and spoke concept”, recycling rates will rise in the region.

**STATE YEARLY MSW DISPOSAL RATE  
VERSUS TRSWA REGION  
(POUNDS/PERSON/DAY)**

Table 4-1

<b>Yearly State MSW Disposal Rate</b>	<b>State Average Lbs./Person/Day</b>	<b>TRSWA Region Lbs./Person/Day*</b>
2000	4.2	3.8
2001	4.3	3.7
2002	4.2	3.6
2003	4.4	3.5
2004	4.4	3.5
2005	4.5	NA
2006	4.4	NA
2007	4.4	3.7
2008	4.2	3.7

FY2008  
COUNTY PER CAPITA DISPOSAL RATES (POUNDS/DAY)  
Table 4-2

COUNTY	MSW
Aiken	3.7
Allendale	2.8
Bamberg	3.7
Barnwell	4.2
Calhoun	3.1
Edgefield	3.4
McCormick	2.3
Orangeburg	4.1
Saluda	3.2
<b>Weighted Average</b>	<b>3.7</b>

MSW DISPOSAL TONNAGES BY COUNTY  
Table 4-3

COUNTY	BASE YEAR (FY 1993)	FY 2008	FY 2010 Projected	FY 2020 Projected
Aiken	117,053	103,770	108,000	108,000
Allendale	8,503	5,287	4,300	4,300
Bamberg	12,473	10,471	10,500	10,500
Barnwell	17,856	17,450	14,800	14,800
Calhoun	12,050	8,300	6,100	6,100
Edgefield	15,665	15,510	15,500	15,500
McCormick	7,173	4,138	4,000	4,000
Orangeburg	84,690	67,716	60,100	60,100
Saluda	11,233	11,020	11,000	11,000
<b>TOTAL</b>	<b>286,696</b>	<b>243,662</b>	<b>234,300</b>	<b>234,300</b>





## 5.0 DEFINITIONS

**Airspace** – the volume of space in a landfill that is available for the deposit of waste, calculated by determining the geometric dimensions of the landfill, reported in cubic yards.

**Appendix 1 Waste** – those materials listed in Appendix 1 of the Solid Waste landfill regulations, meaning they are acceptable for disposal in a Class 2 landfill.

**Appendix 2 Waste** – those materials listed in Appendix 2 of the Solid Waste landfill regulations, meaning they are not acceptable for disposal in a Class 2 landfill.

**ASTM** - American Society for Testing and Materials

**Biodegradable Material** - Organic wastes that can be broken down by microorganisms through bacterial activity.

**Biomass** – organic waste material derived from mill residues, agricultural, forestry, or solid waste activities, plus plant-based products produced specifically for energy recovery. (The United States Congress has not adopted a general definition of biomass.) .

**Blue Bag Recycling** – the practice of placing a variety of recyclable materials into a blue plastic bag for residential collection at curbside by a single collection vehicle along with collection of other MSW. Other MSW is placed in different colored bags. “Blue bag” recyclables are those materials designated by the collection entity, based on downstream processing capabilities, but usually include cardboard, newsprint, aluminum, tin cans, plastics, and mixed paper.

**Composting** - The decomposition of biodegradable material (such as yard wastes, brush, and food wastes) through aerobic and thermophilic action to produce humus.

**Commercial Wastes** - Wastes generated by commercial establishments, such as retail or office.

**Commingled Recyclables** - The practice of collecting all designated recyclables in single containers or vehicles for further separation at a later time and/or place.

**Construction and Demolition (C&D) Debris** - Waste material generated by the construction industry in the course of building, remodeling, or destroying buildings, bridges, roads, and other structures. Some materials used in buildings, such as asbestos, are not treated as C&D debris, but are referred to as "Special Wastes" in the SCSWPMA.

**Convenience Center** - A site where citizens can bring household wastes for further handling and transport. Recyclables are generally presorted through the use of separate bins and non-recyclables are put into a compactor for transport to a landfill. Additionally or alternatively, recyclables can be commingled and sent for further processing at another facility. These sites are staffed by personnel who assist the public with separation of their MSW and also aid in

education and dissemination of information. Sites are generally open five days a week, up to twelve hours per day. Convenience Centers are accessed through large, drive-through gates that allow citizens to bring in bulky materials such as appliances, used tires, and furniture. The sites are permitted through SCDHEC and must conform to certain regulations regarding their construction and operation.

**Curbside Programs** - Collection system where household MSW is picked up in neighborhoods where individuals place their wastes at the curb, often in specially marked containers. Trained personnel keep the recyclables separated, either through the use of separate collection routes or through the use of special compartmentalized trucks.

**Diversion Rate** - The rate at which previously landfilled materials are diverted to other avenues through recycling, source reduction, incineration, or other means.

**DHEC or SCDHEC** – The South Carolina Department of Health and Environmental Control

**Drop-off Site** - See Convenience Center

**EPA** – The United States Environmental Protection Agency

**Every-Other-Week (EOW) Collection** – refers to collection systems where the generators utilize two separate containers one for MSW and one for recyclables, and the hauler rotates collection so that each container is picked up every other week.

**Flow Control** - A means through which waste is directed by law to go to a particular treatment and /or disposal facility.

**Garbage** – (European definition) Food and associated wastes discarded by restaurants, hotels, hospitals, open markets, and similar institutions. It is also called wet or wet food waste. Though not sanctioned in the United States, the term is often used interchangeably with MSW.

**Groundwater** - Water that flows beneath the earth's surface, generally considered to feed into aquifers (underground pockets of water).

**Hazardous Waste** - Waste material that is deemed to pose a potential threat to health or the environment. This waste is regulated under Subtitle C of the Resource Conservation and Recovery Act (RCRA). According to Subtitle C of RCRA, hazardous waste must first be deemed to be wastes, and then they must exhibit one of the characteristics of ignitability, corrosivity, toxicity, or reactivity in order to be considered hazardous wastes.

**Incineration** - The controlled burning of waste materials often used to generate energy in the form of heat and/or steam.

**Industrial Wastes** - MSW generated through manufacturing processes, factories, processing plants, and similar industries.

**Integrated Solid Waste** - The integration of the various components of solid waste management into an overall system in order to optimize available resources. The management of the larger system is usually managed by one body that can coordinate the individual components, such as source reduction, recycling, transportation, incineration, public education, composting, special waste handling, and litter control.

**Leachate** - Liquid that has percolated through wastes. This liquid will be collected, monitored, and treated in Subtitle D landfills due to the potential for collecting hazardous materials from the waste.

**Local government** – A political subdivision of the state, such as an incorporated municipality, county, a special purpose district, or Authority.

**Liner** - As it applies to landfills, either a layer of low permeability soil (clay) or synthetic material (e.g. high density polyethylene), or a combination of both.

**Manual Separation** - The separation of recyclable materials through hand sorting, generally by individuals working on conveyor lines.

**Mass Burn** - The incineration of MSW without prior sorting or processing.

**Materials Recovery Facility (MRF)** - A facility for separating and processing recyclables for sale to a processor. MRFs can be designed as any combination of the following: manual separation; mechanical separation; separation of mass-collected MSW; or separation of commingled recyclables.

**Mechanical Separation** - The separation of wastes at Materials Recovery Facilities (MRFs) through the use of mechanical means, such as magnets, air classifiers, screens, shredders, balers, densifiers, grinders, crushers, and pelletizers.

**Methane** - An odorless, colorless, gas produced by decomposition of organic materials. Methane is emitted from landfills and must be monitored. Its production contributes to the “greenhouse effect” in the atmosphere. When produced by decomposition of organic materials in landfills, its preferred use is to produce energy.

**Merchant Facility** – a facility that profits from the handling and/or disposal of waste or recyclable materials generated by someone other than the owner of the merchant facility.

**Mixed Waste** - Traditionally refers to a mixture of hazardous and non-hazardous wastes, subject to two or more regulatory jurisdictions, with the more stringent applied. Today, the term is being used by some people in the non-hazardous waste field to refer to loads of material in which recyclables are mixed with MSW.

**Mulch** - Ground or chipped organic materials used to prevent evaporation of moisture around plants. Mulch is not made from decayed material and is not to be confused with compost.

**Municipal Solid Waste (MSW)** - Non-hazardous wastes, including yard trimmings, generated in households, commercial and business establishments, institutions, and some industrial processes. In practice, definitions vary and traditionally mean the materials that can be accepted in a municipal landfill, i.e., acceptable in a Subtitle D landfill, that exhibit handling characteristics consistent with household wastes. Municipal solid waste as defined by the state of South Carolina is “the combined residential, commercial, institutional/non-profit and industrial packaging/office waste generated. This includes paper, cans, bottles, food scraps, yard trimmings, packaging, and other items. It does not include industrial process waste like scraps and by-products from the manufacturing process, C&D debris, automobile waste, combustion ash, mining waste and sewage sludge as well as hazardous, infectious and radioactive waste.”

**NIMBY** - Acronym for "Not in My Back Yard" usually referring to public opposition to location of a solid waste facility.

**Privatization** - An arrangement where a private, for-profit entity provides a service for which a public entity is otherwise responsible. In MSW management, the term usually refers to private operation of landfills, MRFs, and collection systems.

**Process-Engineered Fuel (PEF)** – A solid fuel that is a combination of residuals from upstream recycling processes, is a consistent, medium-BTU fuel, produced through an engineered and controlled process. Under the South Carolina Solid Waste policy and Management Act, PEF meets the definition of a “recovered material.” Under some state and federal definitions, it is also considered a “renewable energy resource.”

**Recovered Material** – A material that has been transformed into a useful state through a segregation, process, or recycling process.

**Recovered Materials Baling Operations (RMBO - pronounced RAMBO)** - A facility for processing source-separated recyclables for sale to an end user. RMBOs only accept relatively uncontaminated recyclable materials, and processing is generally limited to baling and storing.

**Recyclables** - Materials that can still be processed into a useful state after they have served their original purpose.

**Refuse** – (European definition) Combination of rubbish and garbage, this portion of the waste stream is typically household waste. Moisture content is high and Btu content is low, but a relatively consistent fuel (see below) can be derived from refuse when processed correctly at a Materials Recovery Facility.

**Refuse-Derived Fuel (RDF)** – (European origin) Combustible material derived from rubbish and garbage, often used to supplement other fuels in industrial boilers.

**Regionalization** - An arrangement where two or more political subdivisions agree to work cooperatively to provide services for their constituents.

**Resource Recovery** - The recovery and utilization of materials or energy from the waste stream.

**Reuse** - The use of a product more than once.

**Roll-off Container** - A large metal container used for MSW collection that can be mechanically loaded and unloaded onto flatbed trucks for transportation.

**Rubbish** – (European definition) – household waste.

**Sanitary Landfill** - Permitted depository for Municipal Solid Waste (MSW), currently permitted according to regulations written pursuant to Subtitle D of the federal Resource Conservation and Recovery Act (RCRA).

**Single Stream Recycling** – similar to Blue bag recycling, this term refers to a collection system for recyclables whereby all designated recyclable materials are collected together. Whereas Blue bag recycling typically refers to a collection system that commingles blue bags that are collected with other MSW in the same vehicle, single stream recycling usually refers to a system that utilizes a separate collection vehicle to collect recyclables exclusively. The recyclables may or may not be contained in bags, depending on the preferences of the system operator.

**Sludge** - A semi-liquid residue remaining from the treatment of water, sewage, or wastewater.

**Source Reduction** - Reducing the quantity of waste materials that eventually become MSW by changing packaging, manufacturing, or use patterns.

**Source Separation** - Separating recyclables at the point of waste generation, such as curbside separation or separation at an industrial point of generation.

**Special Wastes** - Items that are not banned from disposal but require special handling and should be separated from the rest of the MSW stream. Examples are lead-based paint, treated lumber, asbestos, and some industrial and wastewater sludge.

**Specific Wastes** -- Items that are banned from disposal and require special handling and should be separated from the rest of the MSW stream. Examples are pallets, waste oil, tires, used appliances (white goods), and lead acid batteries.

**Subtitle D** - The section of the federal Resource Conservation and Recovery Act (RCRA) that addresses the management of solid, non-hazardous wastes.

**Subtitle D Landfill** - The type of landfill that is required for disposal of MSW in South Carolina beginning October 9, 1993. Compared to Sanitary Landfills of the past, more stringent regulations apply with regard to location, design, construction, operations, closure, and post-closure care.

**Syngas** – Synthesis gas (syngas) is the term used to describe the product derived from the synthesis of solid, carbon-based materials through thermal conversion, in the absence of oxygen. Thermal conversion in the presence of oxygen would generate a flame, or incineration. Syngas is made up of carbon dioxide (CO<sub>2</sub>), carbon monoxide (CO), and hydrogen (H<sub>2</sub>). Syngas has a relatively low Btu value, but its conversion to energy is cleaner and more efficient than combustion processes.

**Tipping Fee** - A disposal fee, usually stated in dollars per ton or cubic yard. Tipping fees can be set by responsible entities and apply to wastes at landfills, transfer stations, materials recovery facilities (MRFs), waste-to-energy facilities, or any other location receiving solid waste.

**Tipping Floor** - Unloading area for vehicles at a transfer, disposal, or treatment facility.

**Transfer Station** - A site where waste materials are brought in from satellite collection centers and processed in some way so as to make the overall collection and transport system more efficient. In some cases, the recyclables brought in to a Transfer Station may be pre-sorted before being sent to a MRF or RMBO for further processing, and the non-recyclables may be compacted and transported by larger trucks, rail, or barges to a landfill.

**Tub Grinder** - Grinding machine/ hammer mill, generally used for wood and construction debris, that consists of grinding hammers working against a steel grate located inside a tub. The materials to be ground are placed in the tub where they pass through the grinding apparatus before falling onto a conveyor.

**Waste-to-Energy** - Generally, “waste-to-energy” is the term used to reference facilities that are built to incinerate unprocessed MSW on a mass scale. Energy is produced through heat recovery which is generally used to produce steam, electricity, or both.

**Waste Stream** - The flow of solid waste, used to describe any portion of MSW, such as "residential waste stream" or "industrial waste stream.”

**Waste Transformation** - chemical, thermal or biological conversion of waste materials that can produce energy through products other than heat, such as ethanol (vehicle fuel), hydrogen, methane, and syngas, in addition to steam and/or electricity .

**Water Table** – Uppermost level below the earth's surface at which the ground becomes saturated with water.

**White Goods** - Metal appliances, such as refrigerators, stoves, washers, dryers, etc.

**Yard Wastes** - Organic materials produced by lawn and landscaping work, such as grass, small brush, and leaves.

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## **6.0 COLLECTION AND TRANSPORT SYSTEM**

All counties and municipalities in the region have abolished uncontrolled green box sites and established collection centers or, preferably, curbside pickup by approved contractors. The region seeks to have MSW separated into five categories at the collection point - (1) recyclables, (2) inert (Class 2) buriables, (3) “Specific” wastes, (4) “Special” wastes, and (5) Subtitle D (Class 3) buriables. These broad categories will be further refined into subcategories according to processing capabilities and economic considerations. For instance, residuals and rejects from the “recyclables” stream will be further processed so as to manufacture process-engineered fuel (PEF) rather than landfilling high-energy wastes. TRSWA encourages the recycling of construction and demolition debris and land-clearing debris (C&DLCD). Though C&DLCD materials are not currently included in the definition of MSW, the region encourages the development of systems to recycle these materials where practical. Waste Recovery systems are not limited to recyclables. In some cases, specific wastes or special wastes can be recovered for beneficial use. Another example of a recovery system is a landfill gas recovery system that recovers energy from the buried waste materials.

An important factor to be considered in determining cost of solid waste management is the cost of collection and transport. Generally, collection and transport of MSW accounts for eighty percent (80%) of the overall costs of waste management. The cost of collection and transport must be considered when developing systems designed to recover discarded materials as noted above. Likewise, any systems in place or contemplated by the region must conform to normal collection and transport practices. In the transportation systems described in this plan, the following assumptions are made: 1) Residents in rural areas take MSW directly to drop-off sites in personal vehicles; 2) Vehicles that consolidate the MSW at drop-off sites, for transport to a transfer station, RMBO, MRF, or landfill, are specialty vehicles with normal hauling capacities of ten to thirty cubic yards. Allowance is made, however, for pickup trucks, automobiles, stake-body trucks, and other non-commercial collection vehicles as may be encountered on a day to day basis; 3) Commercial and municipal collection is usually accomplished at curbside or at special loading docks at business locations, with some source separation capabilities available with either system; and 4) Over-the-road transport trucks are diesel powered tractor-trailer rigs, with trailer capacity of at least ninety cubic yards. TRSWA provides over-the-road transport from transfer stations.

### **6.1 Transfer stations**

Transfer Stations are “break-bulk” locations where materials are shipped in from the rural collection sites, collection routes, drop-off sites, municipal pickups, and industrial or commercial points. Recyclable materials are placed into bins of like materials for further separation at the area MRFs. Workers pull out recyclables that can be easily separated at the transfer station, such as cardboard, and send these to a RMBO.

It is the intent of the region that some sorting of materials can be accomplished at transfer stations so that transportation to the RMBOs or MRFs can be most efficient. The counties can

implement any of several systems to accomplish the sorting/recycling objectives. It is possible that recyclables could be commingled and collected in “single stream” systems; they may be collected in a “blue bag” or similar system, co-collected with MSW and separated later at a MRF; or they may be segregated at the collection point. The region encourages “Recovered Materials Baling Operations (RMBOs)” to be operated in conjunction with transfer stations. These facilities receive segregated recyclables and bale or package the materials for sale. The region encourages its member counties to establish tier pricing structures so as to encourage more delivery of segregated recyclable materials, such as pallets, cardboard, paper, and metals.

As the total system matures, more separation could be accomplished at these transfer stations. Identification of recyclables should expand into a number of areas, including industrial and C&DLCD materials that could be converted into process-engineered fuel (PEF). Education would allow for the expansion of recyclable materials over time. The primary goals accomplished by this early separation process would be: 1) identification of source and type of materials would be enhanced because the transfer station is closer to the generation point, and 2) compaction of non-recyclables could be accomplished before the major transportation hauls occur. Any new transfer stations in the region are allowed if all materials going through the transfer station are to be sent to a facility owned and operated by TRSWA or the counties.

## REGIONAL TRANSFER STATIONS

Table 6-1

AREA	NUMBER	SIZE
Aiken West*		125 tons/day
Barnwell	1	75 tons/day
Orangeburg East/Calhoun	1	200 tons/day
Orangeburg West/Aiken East**		100 tons/day
Bamberg***	1	40 tons/day
Edgefield/McCormick/Saluda	1	125 tons/day

[\*Aiken County does not currently have a transfer station, but is considering the option, in conjunction with the city of Aiken. North Augusta may expand its recycling facility to act as a transfer station as well.]

\*\*Orangeburg County should consider a transfer station at the Orangeburg County maintenance area outside Neeses. This transfer station could also service eastern Aiken County.]

\*\*\*Bamberg County permits the use of part of its property for transfer of Hampton County waste through an agreement with Waste Management Company to a Waste Management owned landfill in Dorchester County. The transfer station handles approximately 50 tons a day of Bamberg County MSW and approximately 20 tons per day of Hampton County MSW.]

Capital cost for a transfer station is typically around \$4,000 per ton of daily operating capacity which pays for the building, tipping floor, and related support systems. In the transfer stations recommended for this region, additional costs for a pre-sorting conveyor system would add around \$75,000 each. Total capital costs, then, for the scenario depicted in the table above, including pre-sorting conveyor systems, would be around \$3,000,000. Labor costs associated with running the transfer station and conveyor system would be around \$4 per ton per year, maintenance and capital depreciation costs run about \$3 per ton per year, and utilities and upkeep run around \$1 per ton per year. Total annual operations costs for the system depicted in the table above would be around \$1,500,000.

Pre-sorting and compaction may not be necessary or desirable at all transfer stations. The determining factors will be the transportation and labor costs to be saved. Therefore, because it is the intent of the region to maximize recycling while minimizing costs, the pros and cons for pre-sorting will be determined by an analysis of the following:

- a) transportation costs saved through compaction, and
- b) benefits reaped from recycling; *versus*,
- c) the extra capital and operating costs associated with putting in conveyor, separation, and compaction systems.

The Authority owns and operates transport equipment which is used to haul MSW from transfer stations to the regional landfill. A breakdown of costs is included in this Section. The Authority will also provide transportation in the future for recyclables collected at the Resource Recovery Facilities, if desired by the member counties.

The Authority and its member counties should institute tier pricing for commodities that are delivered to the transfer stations in source-separated loads. The recovery of these commodities results in a lower cost of transportation and disposal, hence, justifying a reduced tipping fee to the generator. Fees are highest for non-recyclable MSW, median-priced for commingled recyclables, and lowest for source separated recyclables.

## **6.2 Drop-Off Sites**

The governments of the region have constructed Drop-Off Sites (also referred to as Convenience Centers) that are available to all citizens living in the region, whether residing in incorporated or unincorporated areas. The only restrictions are that the users must reside in the county in which the drop off site is located, and no industrial or commercial MSW is allowed. Businesses are allowed to bring clean, source-separated recyclables to many Convenience Centers. Though often misunderstood, these sites are fully accessible by residents of incorporated areas, even if their municipality provides other means of collection. A common practice for many municipalities in the region is to have curbside pickup for MSW provided by the town and to have citizens utilize county-operated Drop-Off sites for recyclables. Also, the drop off sites are not intended to be the sole method of collection and disposal for individuals, but are merely intended to serve as a convenience; hence the term “Convenience Center” is often used to describe these sites. The governments of the region prefer and encourage private citizens

to contract with private haulers for curbside or street-side collection.

The preferred systems for collection are as follows:

- Most residential MSW in urban areas should be picked up at curbside. Non-recyclable MSW should be placed in a separate roll-out cart, and the following recyclables should be commingled in a second roll-out cart: all paper and paperboard, all cardboard, all plastic (except pvc), aluminum cans, and tin cans. These recyclables should be placed in a separate roll-out cart or container for collection in a separate vehicle. In order to utilize the same vehicles currently in use, haulers are encouraged to implement every-other-week (EOW) collection. After being delivered to a transfer station, non-recyclables should be loaded into separate over-the-road transport trailers for delivery to the regional Subtitle D landfill. Recyclables should be loaded into separate over-the-road trailers for delivery to the regional MRF.
- Some residential MSW should be co-collected with recyclables, using one collection vehicle, through what is known as the blue bag system because recyclables are placed in a blue, plastic bag. The entire load is delivered to a MRF, where the blue bags are separated for processing, and the remaining MSW is sent to the regional landfill.
- County-operated convenience centers should be open a minimum of ten hours every Saturday, plus a minimum of four hours on each of two other days during the week. All citizens have access to convenience centers. At convenience centers, recyclables should be commingled and placed in a separate compactor/collection bin: all paper and paperboard, all cardboard, all plastic (except pvc), aluminum cans, and tin cans. Alternatively, “blue bag” recyclables could be placed in MSW compactors along with bagged MSW. These materials should be delivered to the county transfer station and loaded into separate over-the-road trailers for transfer to the regional MRF. If the blue bag system is incorporated at the transfer station, a separate loading area and/or loading system should be employed so that the recyclables can be quickly and easily diverted from the rest of the MSW stream. At the discretion of the counties, when hauling distances are not too great, separate collection bins may be used at the convenience centers for clean, source separated recyclables. These clean, segregated recyclables should be taken directly to the RMBO for processing.
- Convenience centers (drop-off sites) should be available for businesses to bring clean, segregated recyclables at no charge. Non-recyclables should be delivered to the transfer station for transport to the regional Subtitle D landfill. Specific wastes from residences should be collected at convenience centers and delivered to the appropriate outlet. If there is not an outlet for the specific wastes in the county of generation, then those specific wastes should be stored at the transfer stations until they are picked up by an end-user or processor. For tires and waste pallets, TRSWA picks up those materials and removes them for further processing and disposition. Separate collection bins should be provided at all convenience centers for bulky materials and yard trimmings.

- Commercial and industrial wastes should be collected in a manner consistent with residential: that is, separate bins should be provided so that recyclables can be separated from non-recyclables. Commercial and industrial wastes should be collected by private, for-profit, hauling companies. The hauler should be charged a reduced price at the county transfer station or RMBO for separated recyclables and should be charged the commercial rate for non-recyclables delivered to the county-operated transfer station or RMBO.

The counties of the region formed TRSWA in order to benefit from the economies of scale derived from a large, regional landfill; therefore, the costs for residential disposal have not rise dramatically. Additionally, disposal typically accounts for only around 20% of total costs. Significant cost increases have been seen in collection and transportation, however, as energy costs increased and as distances to drop-off sites increased. Curbside collection is less expensive than personal vehicle delivery to a convenience center unless the convenience center is located such that it does not create the need for an additional trip, and curbside collection is environmentally preferable. Fewer greenhouse gases are generated when a single collection vehicle is used to service one route as opposed to the use of individual vehicles.

Around 30% of the region's people live in unincorporated areas. Though curbside pickup is encouraged, most people in these areas utilize convenience centers (drop-off sites) for the MSW disposal. It is estimated that around 83% of people living in unincorporated areas utilize convenience centers, and around 17% utilize streetside collection services. Therefore, around 25% of the region's MSW is deposited at convenience centers. Transportation and handling costs can be inordinately high for the individuals living in these unincorporated areas, unless the convenience center is located such that minimal additional mileage is necessary. Vehicle emissions, wear and tear on equipment and roads, plus increased littering and open dumping all combine for a negative impact on the environment. Residents incur additional travel expenses in order to bring their individual MSW to drop-off sites as a result of "green box" closings. The following table is used to estimate the additional costs passed on to these rural residents as a result of having to travel to drop-off sites. Calculation is based on a generation rate of 1 ton per household per year, and an average of 2 trips per household per week, an average distance traveled of 5 miles per trip, at a cost of \$.55 per mile. Using these assumptions, each household would incur a cost of \$5 per week. (In fact, convenience centers are on average around 7 miles or 14 miles round-trip from each house, but the assumption here is that most trips are not actually separate events but are coordinated with other activities, such as going to work or shop.) Each ton would cost an additional \$260 annually to the residential population represented here. Approximately 25% of the region's MSW is transported to Drop-Off sites in the manner described here. After delivery to Drop-Off sites, county governments incur the costs of transporting materials to transfer stations, RMBOs, or MRFs. Consolidation and compaction of the MSW results in a lower transportation cost per ton when compared to costs associated with getting the materials to the Drop-Off sites by individuals. There is also an additional costs associated with litter pickup on the highways, assuming that much of this litter is the result of materials blowing out of pickup trucks owned by individuals who use the pickup trucks to haul garbage to the drop-off sites. The region encourages citizens to contract with private haulers for streetside pickup.

INDIVIDUAL TRANSPORTATION COSTS (RURAL AREAS)

Table 6-2

CCD*		Tons/Year	Trips/Year	Miles/Year	Cost/Year
Cameron					
	Rural Sites (3)	1,027	106,808	534,040	\$ 264,350
St. Matthews					
	Rural Sites (6)	1,257	130,728	653,640	\$ 323,552
<b>Calhoun County</b>		<b>2,284</b>	<b>237,536</b>	<b>1,187,680</b>	<b>\$ 587,902</b>
Rowesville					
	Rural Sites (1)	368	38,272	191,360	\$ 94,723
Bowman					
	Rural Sites (2)	994	103,376	516,880	\$ 255,856
Nesses					
	Rural Sites (1)	693	72,072	360,360	\$ 178,378
North					
	Rural Sites (1)	1,158	120,432	602,160	\$ 298,069
Norway					
	Rural Sites (1)	529	55,016	275,080	\$ 136,165
Springfield					
	Rural Sites (1)	505	52,520	262,600	\$ 129,987
Santee					
	Rural Sites (2)	1,483	154,232	771,160	\$ 381,724
Orangeburg					
	Rural Sites (4)	8,433	877,032	4,385,160	\$ 2,170,654
Cordova					
	Rural Sites (2)	1,008	104,832	524,160	\$ 259,459

CCD*		Tons/Year	Trips/Year	Miles/Year	Cost/Year
Elloree					
	Rural Sites (1)	794	82,576	412,880	\$ 204,376
Eutawville					
	Rural Sites (1)	1,039	108,056	540,280	\$ 267,439
Holly Hill					
	Rural Sites (2)	1,626	169,104	845,520	\$ 418,532
<b>Orangeburg County</b>		<b>18,630</b>	<b>1,937,520</b>	<b>9,687,600</b>	<b>\$ 4,795,362</b>
Bamberg/Ehrhardt					
	Rural Sites (4)	1,529	158,975	794,877	\$ 393,464
Denmark/Olar					
	Rural Sites (3)	1,351	140,504	702,520	\$ 347,747
<b>Bamberg County</b>		<b>2,880</b>	<b>299,479</b>	<b>1,497,397</b>	<b>\$ 741,212</b>
Allendale/Fairfax					
	Rural Sites (4)	658	68,432	342,160	\$ 169,369
Martin/Millett					
	Rural Sites (2)	329	34,216	171,080	\$ 84,685
Sycamore					
	Rural Sites (2)	329	34,216	171,080	\$ 84,685
<b>Allendale County</b>		<b>1,316</b>	<b>136,864</b>	<b>684,320</b>	<b>\$ 338,738</b>
Barnwell					
	Rural Sites (3)	2,290	238,160	1,190,800	\$ 589,446
Blackville					
	Rural Sites (2)	1,228	127,712	638,560	\$ 316,087
Williston/Elko					
	Rural Sites (3)	2,102	218,608	1,093,040	\$ 541,055

CCD*		Tons/Year	Trips/Year	Miles/Year	Cost/Year
Snelling					
	Rural Sites (1)	257	26,728	133,640	\$ 66,152
Kline					
	Rural Sites (1)	257	26,728	133,640	\$ 66,152
<b>Barnwell County</b>		<b>6,134</b>	<b>637,936</b>	<b>3,189,680</b>	<b>\$ 1,578,892</b>
Wagener					
	Rural Sites (2)	984	102,335	511,675	\$ 253,279
Aiken					
	Drop-offs (3)	6,466	672,491	3,362,455	\$ 1,664,415
North Augusta					
	Drop-offs (2)	2,369	246,424	1,232,119	\$ 609,899
New Ellenton					
	Rural Sites (1)	1,942	202,004	1,010,022	\$ 499,961
Salley					
	Rural Sites (1)	879	91,410	457,049	\$ 226,239
Windsor					
	Rural Sites (1)	1,338	139,200	695,999	\$ 344,520
Edisto/Shaws					
	Rural Sites (1)	1,183	123,005	615,025	\$ 304,437
<b>Aiken County</b>		<b>15,162</b>	<b>1,576,869</b>	<b>7,884,344</b>	<b>\$ 3,902,750</b>
Johnston					
	Rural Sites (3)	1,322	137,488	687,440	\$ 340,283
Trenton					
	Rural Sites (3)	1,286	133,744	668,720	\$ 331,016
Edgefield					
	Rural Sites (4)	1,738	180,752	903,760	\$ 447,361



CCD*		Tons/Year	Trips/Year	Miles/Year	Cost/Year
<b>Edgefield County</b>		<b>4,346</b>	<b>451,984</b>	<b>2,259,920</b>	<b>\$ 1,118,660</b>
Saluda					
	Rural Sites (4)	1,537	159,848	799,240	\$ 395,624
Saluda Traffic Circle					
	Rural Sites (2)	1,169	121,576	607,880	\$ 300,901
Batesburg					
	Rural Sites (1)	421	43,784	218,920	\$ 108,365
<b>Saluda County</b>		<b>3,127</b>	<b>325,208</b>	<b>1,626,040</b>	<b>\$ 804,890</b>
McCormick					
	Rural Sites (4)	1,232	128,128	640,640	\$ 317,117
Lake Thurmond					
	Rural Sites (1)	675	70,200	351,000	\$ 173,745
<b>McCormick County</b>		<b>1,907</b>	<b>198,328</b>	<b>991,640</b>	<b>\$ 490,862</b>
<b>Region Total</b>		<b>55,786</b>	<b>5,801,724</b>	<b>29,008,621</b>	<b>\$ 14,359,267</b>
<b>Total Percentage of Region's MSW</b>					<b>23%</b>
<b>Subtotal Individual Transportation Costs</b>					<b>\$ 14,359,267</b>
<b>Total Population Represented</b>					<b>360,439</b>
<b>Cost Per Capita</b>					<b>\$ 39.84</b>
<b>Cost Per Ton</b>					<b>\$ 257.40</b>

- CCD refers to County Census Division
- Population figures are based on Y2000 U.S. Census

As stated earlier, urban areas contribute significantly more to the total MSW than rural areas. Concentrating on urban and commercial/industrial MSW can produce the best overall results for the region for the least effort and cost. Costs associated with handling the wastes, however, are much larger per ton and per person for rural areas. When recommending treatment options from the viewpoint of the individual generator, then, source reduction is even more critical for rural areas than for urban areas.

Currently, most of the urban and commercial/industrial portions of the waste stream are collected by cities and private companies. The Authority and its member counties work with generators, haulers, and municipalities to find ways to divert and reduce portions of this waste stream. An exemplary program already in place is sponsored by Aiken County, called IREUSE, which brings industry and private haulers together to find ways to reduce and reuse.

When determining collection and transportation costs for the region, it must be remembered that most municipal, industrial, and commercial MSW is usually collected by someone other than TRSWA or its member counties. Knowing this, the South Carolina legislature mandated in SCSWPMA that counties work with municipalities and private companies to collect data and information and, generally, to coordinate the management of waste materials. As a practical matter, this effort is complex and always incomplete despite the best efforts of the counties to do so. For purposes of this Plan, it is assumed that the following represents the current practices for collection and hauling:

Rural residential MSW	100% county collection representing 34% of region's total MSW
Urban residential MSW	90% city collection and 10% private collection, representing 17% of region's MSW
Industrial/commercial MSW	90% private collection and 10% city collection, representing 49% of region's MSW

LOCAL GOVERNMENT TRANSPORTATION COSTS (CITIES AND COUNTIES)

Table 6-3

Collection Point	Tons/Day	Truck Loads/Day	One-Way Miles/Day	Cost/Year
Wagener				
Rural Sites (2)	7.9	2.0	90	102,059
Aiken				
City	42.7	10.7	225	257,400
Drop-offs (4)	80.5	20.1	413	472,472
North Augusta				
City	34.8	8.7	188	215,072
Drop-offs (3)	44.5	11.1	238	272,272
New Ellenton				
Rural Site (1)	6.7	1.7	23	26,312

<b>Collection Point</b>	<b>Tons/Day</b>	<b>Truck Loads/Day</b>	<b>One-Way Miles/Day</b>	<b>Cost/Year</b>
Allendale/Fairfax				
City	2.9	0.7	40	45,760
Rural Sites (5)	4.4	1.1	80	91,520
Bamberg/Ehrhardt				
City	5.9	1.5	15	17,160
Rural Sites (6)	8.9	2.2	15	17,160
Denmark/Olar				
City	7.9	2.0	20	22,880
Rural Sites (2)	2.0	0.5	10	11,440
Barnwell				
City	6.8	1.7	10	11,440
Rural Sites (2)	4.1	1.0	8	9,152
Blackville				
City	1.8	0.5	7	8,008
Rural Sites (2)	3.6	0.9	14	16,016
Williston				
City	2.3	0.6	14	16,016
Rural Sites (3)	3.6	0.9	14	16,016
Cameron				
Rural Sites (3)	8.0	2.0	80	91,520
St. Matthews				
Rural Sites (6)	8.5	2.1	32	36,608
Johnston				
City	2.1	0.5	5	5,720
Drop-offs (2)	4.2	1.0	10	11,440
McCormick				
City	2.0	0.5	17	19,448
Rural Sites (2)	4.7	1.2	51	58,344

<b>Collection Point</b>	<b>Tons/Day</b>	<b>Truck Loads/Day</b>	<b>One-Way Miles/Day</b>	<b>Cost/Year</b>
Lake Thurmond				
Rural Sites (2)	4.7	1.2	60	68,640
Rowesville	5.2			
Rural Sites (2)	10.4	2.6	100	114,400
Bowman				
City	2.1	0.5	25	28,600
Rural Sites (2)	4.2	1.0	50	57,200
Neeses				
Rural Sites (2)	6.2	1.6	38	43,472
Springfield				
Rural Sites (3)	7.3	1.8	80	91,520
Vance				
Rural Sites (3)	18.2	4.6	200	228,800
Orangeburg				
Drop-offs (9)	29.6	7.4	140	160,160
City Pick-up	18.2	4.6	75	85,800
Trenton				
Rural Sites (3)	4.6	1.1	30	34,320
Edgefield				
City	2.1	0.5	10	11,440
Rural Sites (4)	4.6	1.1	20	22,880
Ridge Spring				
City	1.9	0.5	5	5,720
Rural Site (1)	4.4	1.1	25	28,600
Saluda				
City	3.7	0.9	36	41,184
Rural Sites (4)	5.2	1.3	84	96,096

<b>Collection Point</b>	<b>Tons/Day</b>	<b>Truck Loads/Day</b>	<b>One-Way Miles/Day</b>	<b>Cost/Year</b>
Saluda Traffic Circle				
Rural Sites (2)	8.9	2.2	75	85,800
Batesburg				
Rural Site (1)	5.2	1.3	75	85,800
<b>Region Total</b>	<b>447.0</b>			
<b>TOTAL ANNUAL TONNAGE REPRESENTED</b>				<b>127,845</b>
<b>TOTAL PERCENTAGE OF REGION'S MSW</b>				<b>55%</b>
<b>SUBTOTAL LOCAL GOVERNMENT TRANSPORTATION COSTS</b>				<b>\$3,141,667</b>
<b>TOTAL POPULATION REPRESENTED</b>				<b>360,439</b>
<b>COST PER CAPITA PER YEAR</b>				<b>\$8.72</b>
<b>COST PER TON</b>				<b>\$24.57</b>

Regardless of how the MSW is collected and hauled to the transfer stations or drop-off sites, the region assumes responsibility downstream from the transfer station for transporting the materials to the proper disposal or recycling location. The region's transportation and handling charges are shown on Tables 6-3 and 6-4 and are calculated by the following method: transfer trucks used by counties for this purpose are assumed to be 16 yard capacity, and total tonnage per trip from convenience centers to transfer stations is assumed to be four tons. Mileages are based on distances from individual convenience centers to the county transfer station or the regional landfill, and costs are calculated at \$2.00 per mile. Transfer trailers transport consolidated MSW from transfer stations to the regional landfill at a cost of approximately \$10 per ton. Transportation costs are calculated at \$2.50 per loaded mile. A year is calculated as 286 days (Monday through Friday, plus half-days on Saturdays).

OVER-THE-ROAD (TRSWA) TRANSPORT

Table 6-4

<b>Collection Point</b>	<b>Tons/Day</b>	<b>Truck Loads/Day</b>	<b>One-Way Miles/Day</b>	<b>Cost/Year</b>
O'burg/Calhoun				
To LF	140	7	595	425,425
To MRF	100	5	425	303,875
Bamberg				
To LF	40	2	90	64,350
To MRF	10	1	45	32,175
Barnwell				
To LF	60	3	120	85,800
To MRF	20	1	40	28,600
Tri-County				
To LF	90	5	250	178,750
To MRF	40	2	100	71,500
WSRS				
To LF	20	1	60	42,900
<b>SUBTOTAL TRSWA TRANSPORTATION COSTS</b>				<b>\$1,233,375</b>
<b>TOTAL POPULATION REPRESENTED</b>				<b>360,439</b>
<b>COST PER CAPITA PERSON/YEAR</b>				<b>\$3.42</b>

Private haulers do not report expenses to the counties or the Region. Private haulers account for approximately 46% of the region's MSW. Based on assumptions, these additional costs are added to Table 6-5 below in order to calculate total regional collection and Transportation.

**TOTAL REGIONAL COLLECTION & TRANSPORTATION COSTS**

**Table 6-5**

<b>SUBTOTAL PRIVATE C&amp;DLCD COLLECTION &amp; TRANSPORTATION</b>	<b>\$1,200,000</b>
<b>SUBTOTAL PRIVATE INDUSTRIAL/COMMERCIAL MSW COLLECTION &amp; TRANSPORTATION</b>	<b>\$2,300,000</b>
<b>SUBTOTAL INDIVIDUAL MSW TRANSPORT COST</b>	<b>\$14,359,267</b>
<b>SUBTOTAL LOCAL GOVERNMENT TRANSPORTATION COSTS</b>	<b>\$3,141,667</b>
<b>SUBTOTAL TRSWA TRANSPORTATION COSTS</b>	<b>\$1,233,375</b>

<b>TOTAL REGIONAL COLLECTION &amp; TRANSPORTATION COSTS</b>	<b>\$22,234,309</b>
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<b>COLLECTION &amp; TRANSPORTATION COSTS PER CAPITA</b>	<b>360,439</b>	<b>\$61.69</b>
<b>COLLECTION &amp; TRANSPORTATION COSTS PER TON</b>	<b>243,662</b>	<b>\$91.25</b>

Though costs are calculated here for the entire region, in practice, private or municipal haulers of MSW charge directly to their customers and then contract with the county or region for disposal. Private haulers or individuals do not report their costs to governments. The governments' share of the above transportation costs is calculated to be \$ 12.14 per capita per year and \$ 17.95 per ton.

TRSWA hopes to reduce the amounts of MSW being transported through public education and industrial recycling efforts. These efforts will hopefully have the effect of directing appropriate waste streams away from the Subtitle D landfill and into recycling facilities, reuse in other industrial applications or, at last resort, inert landfills. This re-direction of materials would result in a positive impact on transportation, environmentally, socially, and financially. Transfer stations will be used to consolidate MSW for over-the-road transportation.





## **7.0 TREATMENT AND DISPOSAL OPTIONS & PLANS**

A status report for the following options is presented in this Plan as required by SC SWPMA. In addition to normal considerations of cost and convenience, all counties and entities involved with MSW management must comply with statutory and regulatory requirements. Additionally, county planners must consider economic, environmental, political, and social implications which result from their decisions. All of these considerations are taken into account when the following treatment and disposal issues are considered:

- 1) Source Reduction
- 2) Reuse
- 3) Recycling
- 4) Waste-to-Energy (WTE) Systems/ Waste Transformation
- 5) Composting
- 6) Landfilling
- 7) Specific Wastes
- 8) Special Waste Handling
- 9) Bioremediation
- 10) Land Application of Sludge
- 11) Hazardous Waste
- 12) Household Hazardous Waste
- 13) Litter Control

### **7.1 Source Reduction**

Source reduction activities fall into several basic categories: product reuse, reduced material volume, reduced toxicity of products, increased product lifetime, and decreased consumption. Efforts to promote source reduction will take the form of education and research, financial incentives and disincentives, and regulation. It is hoped that coordination with business, government, and industrial leaders will result in programs to implement source reduction on a regional basis.

Source reduction is currently being addressed in the area of reduced material volume. In addition to reduction in the home, there are several industrial generators who have initiated source reduction. TRSWA is working with these companies to modify processes and/or policies in order to reduce or completely eliminate solid waste generated at their sites.

Among those are:

#### **Aiken County**

Cytec Industries of North Augusta – Aiken County  
Kimberly-Clark in Aiken County  
Savannah River Nuclear Solutions Company  
URS Washington Division in Aiken County

Southeastern Pipe and Drain in Aiken County  
R.E Phelon Company in Aiken County  
Rieter Automotive NA in Aiken County  
BAE Systems in Aiken County  
Pepperidge Farms in Aiken County  
Shinso American Corp. in Aiken County  
Pactiv Corp. of Aiken County  
Augusta Concrete Block of Aiken County

**Allendale County**

Allendale IGA  
Scotsman Ice Systems in Allendale County

**Barnwell County**

Energy Solutions in Barnwell County  
Milliken and Company in Barnwell County

**Calhoun County**

Carolina Eastman in Calhoun County  
Tee-Pak in Calhoun County  
Tuthill Controls in Calhoun County  
Cameron Bedding in Calhoun County  
Zeus industries

**Edgefield County**

Milliken and Company in Edgefield County

**Orangeburg County**

Decolam in Orangeburg  
Stone Container of Orangeburg County  
Cox Industries in Orangeburg County  
Husqvarna Outdoor Products in Orangeburg County  
Zeus Industrial Products in Orangeburg and Calhoun counties  
Kenco Logistics in Orangeburg County  
Fogle's Piggly Wiggly in Orangeburg County  
Piggly Wiggly of Santee in Orangeburg County  
Koyo Corp. of Orangeburg County  
Sunshine Recycling of Orangeburg County  
CF Evans Company of Orangeburg County

Walmart stores regionally

Three Rivers Solid Waste Authority has purchased and distributed backyard composting bins throughout the nine member counties. Aiken County, Barnwell County, and Tri-County have representatives who visit the schools from time to time to present public education programs encouraging source reduction and recycling. Aiken County and Orangeburg County sponsor Community Leadership Training annually, and waste reduction and recycling are addressed.

DHEC helps companies identify waste minimization opportunities through its Center for Waste Minimization (CWM). They can be reached at 803-896-8986. The CWM is a non-regulatory technical assistance program established to help business and industry identify waste reduction and recycling opportunities. The CWM's activities revolve around two general services: the information clearinghouse and the technical assistance office.

The information clearinghouse service provides company representatives with technical literature, case studies, industry-specific approaches for waste reduction, recycling markets information, referrals and speakers for waste minimization presentations. The CWM is part of a national network of information sources on waste minimization.

Technical assistance is provided through on-site waste minimization assessments. Companies are given site-specific advice on waste minimization possibilities. A follow-up report outlines specific options on waste reduction and recycling strategies. Guidance is also available on establishing an ongoing waste minimization program.

The Center for Waste Minimization also offers on-site Compliance Assistance visits to enhance compliance with environmental regulations by increasing awareness about regulatory and compliance issues. The Center for Waste Minimization will help identify resources available to answer questions and provide support as well as review communication techniques and make recommendations on ways to reduce or eliminate waste streams that may be contributing to environmental problems.

Center for Waste Minimization  
South Carolina Department of Health and Environmental Control  
2600 Bull Street  
Columbia, SC 29201  
(803) 896-8986

## **7.2 Reuse**

Public education will be the primary method to promote reuse of materials presently disposed of in municipal waste landfills. Industry is currently the prime target for reuse, and the region's member counties work closely with industry representatives to encourage reuse. Aiken County sponsors an industry group called IREUSE (Industrial Recycling End Use Services Exchange) to encourage reuse of materials that might otherwise be discarded.

IREUSE began in 1996 as an informal meeting of local industry environmental engineers and/or recycling coordinators to encourage more participation in supplying their recycling information to Aiken County for the Annual South Carolina Solid Waste and Recycling Report. It was decided at the first meeting to continue to meet and discuss the prospect of forming a formal group to share environmental and recycling ideas.

IREUSE representatives meet occasionally with Aiken County, but more often emails and internet swap shops have provided for the following purposes:

- Provide Aiken County Recycling Coordinator with annual recycling information to the extent allowed by their sponsoring companies.
- Share ideas and information with respect to the environmental and/or recycling aspects of their jobs.
- Excess materials information are supplied to the Aiken County Recycling Coordinator for dissemination to all members with the prospect of one of the members having a use for the material. Logistics and price (if applicable to the material) are worked out between the two parties.
- Electronics equipment, breaker panels, conduit, and wiring from renovations and new construction to be made available to local schools and Aiken Technical College for the benefit of instruction for the students.

The region further encourages its member counties and industries to utilize The Southern Waste Information eXchange, Inc. (SWIX) that is a non-profit clearinghouse and repository for industry concerning information on:

- Market development
- Recycled products
- Solid and hazardous waste management
- Current regulations/legislation
- Alternative and emerging waste management technologies
- Trade journals and associations
- Technical reports
- The availability of and demand for waste materials; and
- Waste management services and products

### **7.3 Recycling**

TRSWA Regional Recycling Coordinator is Colin Covington, TRSWA, 227 Gateway Drive, Suite 213, Aiken, SC 29803. Phone: 803-652-2225, x24. The Regional Recycling Coordinator develops and implements recycling programs for the Authority, generates reports, and ensures compliance for Authority programs. The Regional Recycling Coordinator coordinates local recycling activities with the people or positions cited in Section 2.3 of this Plan. These people have

responsibility for local recycling programs including implementation, monitoring, reporting, and compliance. The Regional Recycling Coordinator and local Solid Waste personnel participate in public outreach and education. The Regional Recycling Coordinator and the local personnel coordinate grant programs through DHEC's Office of Solid Waste Reduction and Recycling. For regional programs, and for procurement of recycling materials and/or services used throughout the region, the Authority controls the grant programs. For specialized, local programs, the counties and municipalities coordinate separate grant applications. The primary function of the Regional Recycling Coordinator is to evaluate all recycling programs in the region for economies and compliance with the State and Regional Solid Waste Management Plans.

Recycling is the process of recovering materials for re-processing and ultimate reuse. In this document, the term generally refers to the collection and marketing of these materials, but in some cases, the materials are collected, re-processed, and reused, which closes the recycling loop completely. Materials collected for recycling include the following: 1) Glass; 2) Metal; 3) Paper; Plastic; 4) MSW that is banned from burial (Banned items); and 5) Miscellaneous items. These categories are further divided into subcategories.

**Glass** is typically marketed as "cullet" and is separated by color – clear, brown, and green. If the colors are mixed together, the glass is marketed as "mixed." Market values for glass fluctuate greatly, and it is often not cost effective for governments to recycle. Aiken city and North Augusta are the only two local governments currently recycling glass. TRSWA believes that glass poses a threat to safety and to quality management of other commingled recyclables and, because the market price for glass is generally less than \$20 per ton, TRSWA does not encourage local governments to recycle glass.

**Metal** can be sold in mixed or separated loads. When separated, it is generally separated according to ferrous (magnetic) and non-ferrous (non-magnetic). It can be further separated according to markets. In this region, governments generally sell all metals in mixed loads. This is usually a profitable enterprise, and can be undertaken individually by citizens or companies, as well. Metal recycling is highly encouraged. Not only is metal a valuable commodity that is marketed with relative ease, but the removal of metal is beneficial for other operations, such as landfilling or PEF production, where its presence would cause operational problems.

**Paper** can also be marketed in mixed or separated loads. Aiken County collects and markets mixed paper (pulling out cardboard). Most other counties separate paper to some degree into cardboard, magazines, newspapers, office paper, mixed paper, telephone books, craft paper, and paperboard. Paper markets have generally been good. Counties and municipalities need to consider costs when determining which materials to recover. While mixed paper may yield higher volumes than separated, the market price may not justify the amount of money and work invested in the collection, packaging (baling) and transport. Conversely, while separated paper can bring higher revenues per unit, the number of units may be drastically reduced due to the difficulties involved with the separations operations. The resulting higher disposal costs associated with the paper residual (or rejects) may more than offset the benefits gained through separations. Separations is much more labor intensive, and it may be practical only if inmate labor is available. Counties, municipalities, institutions, and private entities must make these determinations locally.

**Plastic** can be marketed in mixed loads or separated. Considerations as to which method is

preferable are similar to considerations discussed above regarding paper. Plastic presents another problem in that it has a low weight/volume ratio; therefore, large volumes do not normally translate to large weights. Commodities are generally bought according to weight. Plastic is generally separated into (1) “Number 1” plastics, produced from polyethylene terephthalate (known as PET or PETE), that is found in soft drink, water, mouthwash, and similar containers, (2) “Number 2” plastics, produced from high density polyethylene (known as HDPE), that is found in milk jugs, liquid laundry containers, shampoo containers, and similar products, and (3) mixed plastics. Mixed plastics are often not marketed at all, and they are comprised of the following: “Number 3” vinyl, that primarily consists of polyvinyl chloride (PVC); “Number 4” low density polyethylene (LDPE); “Number 5” polypropylene; “Number 6” polystyrene; and “Number 7” that contains combinations of the other six plastics.

**Recyclable items** which are also “Banned items” are those materials that cannot be legally disposed in an MSW (Subtitle D) landfill in South Carolina, but can be recycled. They include lead-acid (vehicle batteries), tires, large appliances (known as white goods), yard waste (leaves and limbs), and land-clearing debris (woody materials). All counties in this region recycle lead-acid batteries, tires, and large appliances. Yard waste and land-clearing debris can be disposed in other landfills and generally are in this region. Grinding and composting of these materials is preferred, and that activity qualifies as recycling. Banned items are part of a larger group of materials referred to as “Specific wastes” in this Plan, as that is the term used in the Solid Waste Policy and Management Act (SWPMA). Specific wastes are not necessarily banned from disposal. Networks have been established by private handlers for some of these products. The counties and the Authority handle used pallets as a specific waste, though pallets are not banned from disposal in an MSW landfill. The Authority recycles between three and four thousand tons of pallets annually and this is a profitable enterprise because it returns revenues to the Authority, and it diverts these tonnages from landfill disposal.

Other examples of miscellaneous items collected for recycling are as follows: **1) antifreeze, 2) consumer electronics, 3) cooking oil, 4) fluorescent tubes, 5) food waste (post-consumer), 6) hazardous household materials (solvents, aerosols, etc.), 7) latex paint, 8) mattresses, 9) textiles, 10) toner cartridges, 11) used oil bottles, 12) used oil filters, 13) wood packaging ( primarily pallets and shipping materials), and 14) other wood (forestry, agricultural, and building residual).** The Authority encourages counties to consider collection and marketing cost/benefit analyses for each of these materials. Because they cause problems in other handling areas, the Authority especially encourages the removal of all of these listed miscellaneous items. The Authority encourages legislation and other incentives and disincentives that may prompt the proper management of these materials.

Recycling alternatives are being explored by a number of organizations within the region. Primary considerations are economics, logistics, social concerns, and markets. There are currently recycling programs in the municipalities of North Augusta, Aiken, New Ellenton, Orangeburg, Edgefield, Johnston, McCormick, and Saluda. There are several ongoing projects, primarily for paper, aluminum, scrap metal, cardboard, plastic, and used oil that are being carried out in many communities. Markets and economics have been worked out to a large degree and can be duplicated in other communities.

There are three Recovered Materials Baling Operations (RMBOs) and one MRF in the region. The RMBOs process recyclable materials that were not previously diverted from the system by individuals or companies. The region plans to take residuals from the RMBOs and recover them as process engineered fuel (PEF) at the regional Materials Recovery Facility (MRF). The regional MRF is planned for the regional landfill site and will supply PEF to facilities for fuel or power generation. (The regional MRF will also include a sorting line to remove clean recyclables from commingled materials). PEF must meet strict standards so that it works as a fuel for an energy process rather than a waste material for which the primary end point would be reduction through combustion. The PEF must be free of many contaminants normally found in the total MSW stream. The region will encourage private haulers to establish recycling programs with two (2) options: 1) individuals and companies will be asked to source-separate recyclables and place them in dedicated containers for further processing and/or deliver them to RMBOs at no charge; and/or 2) individuals and companies will be asked to establish “single stream” collections in which select recyclable materials are commingled for further processing at a MRF. The region supports financial incentive programs through which private haulers can discard source-separated recyclables with no fee, discard commingled recyclables at a nominal fee, and discard non-separated MSW at the highest fee.

The governments of the region prefer and encourage private citizens to contract with private haulers for curbside or street-side collection that includes recycling.

The preferred systems for collection are as follows:

- Most residential MSW in urban areas should be picked up at curbside. Non-recyclable MSW should be placed in a separate roll-out cart, and the following recyclables should be commingled in a second roll-out cart: all paper and paperboard, all cardboard, all plastic (except pvc), aluminum cans, and tin cans. These recyclables should be placed in a separate roll-out cart or container for collection in a separate vehicle. In order to utilize the same vehicles currently in use, haulers are encouraged to implement every-other-week (EOW) collection. After being delivered to a transfer station, non-recyclables should be loaded into separate over-the-road transport trailers for delivery to the regional Subtitle D landfill. Recyclables should be loaded into separate over-the-road trailers for delivery to the regional MRF.
- Some residential MSW should be co-collected with recyclables, using one collection vehicle, through what is known as the blue bag system because recyclables are placed in a blue, plastic bag. The entire load is delivered to a MRF, where the blue bags are separated for processing, and the remaining MSW is sent to the regional landfill.
- County-operated convenience centers should be open a minimum of ten hours every Saturday, plus a minimum of four hours on each of two other days during the week. All citizens have access to convenience centers. At convenience centers, recyclables should be commingled and placed in a separate compactor/collection bin: all paper and paperboard, all cardboard, all plastic (except pvc), aluminum cans, and tin cans. Alternatively, “blue bag” recyclables could be placed in MSW compactors along with

bagged MSW. These materials should be delivered to the county transfer station and loaded into separate over-the-road trailers for transfer to the regional MRF. If the blue bag system is incorporated at the transfer station, a separate loading area and/or loading system should be employed so that the recyclables can be quickly and easily diverted from the rest of the MSW stream. At the discretion of the counties, when hauling distances are not too great, separate collection bins may be used at the convenience centers for clean, source separated recyclables. These clean, segregated recyclables should be taken directly to the RMBO for processing.

- Convenience centers (drop-off sites) should be available for businesses to bring clean, segregated recyclables at no charge. Non-recyclables should be delivered to the transfer station for transport to the regional Subtitle D landfill. Specific wastes from residences should be collected at convenience centers and delivered to the appropriate outlet. If there is not an outlet for the specific wastes in the county of generation, then those specific wastes should be stored at the transfer stations until they are picked up by an end-user or processor. For tires and waste pallets, TRSWA picks up those materials and removes them for further processing and disposition. Separate collection bins should be provided at all convenience centers for bulky materials and yard trimmings.
- Commercial and industrial wastes should be collected in a manner consistent with residential: that is, separate bins should be provided so that recyclables can be separated from non-recyclables. Commercial and industrial wastes should be collected by private, for-profit, hauling companies. The hauler should be charged a reduced price at the county transfer station or RMBO for separated recyclables and should be charged the commercial rate for non-recyclables delivered to the county-operated transfer station or RMBO.

### **7.3.1 Materials Recovery Facilities (MRFs)**

MRFs are automated or semi-automated facilities designed for preparing the finished product to go into the recyclables market. The MRFs generally employ about twenty-five people and are designed to handle large amounts of MSW, generally 200 tons or more per day. Conveyor systems are at the center of the process. Bags are broken open at the beginning of the conveyor line and separation is accomplished through manual and mechanical means.

MRFs can be designed in many different ways. The technology involved with MRFs is evolving rapidly. It may be prudent to keep initial design simple, with the goal of adapting operations and procedures to fit the needs that emerge as the total system develops.



MATERIALS RECOVERY FACILITIES		
COUNTY	LOCATION	SIZE
Aiken	North Augusta	150 tons/day
Aiken	Regional Landfill MRF	400 tons/day
Barnwell	Barnwell County Landfill	5 tons/day

There are a number of designs and operating philosophies associated with Materials Recovery Facilities (MRFs). Designs range from fully manual operations to mostly automated systems. The design chosen usually depends on labor availability and the basic choice between whether one believes that human error is more likely than machine error or vice-versa. As has been stated, TRSWA is constructing a MRF that could separate up to 250 tons of single stream recyclables in an eight hour shift.

Economically and operationally, there have been mixed signals coming out of MRF operations nationwide. Recycling markets are often depressed, and return on investment is questionable. Many MRFs are running far below projected recyclables recovery rates, and capital investment in mechanical separation and processing equipment is high. In this region, the pre-sorting of recyclables into single-stream or blue bag systems, coupled with a semi-automated MRF, is recommended as a way to hedge against the downside that could result from poor markets or mechanical problems. It is hoped that a system would be designed so as to allow for expansion as markets and technology improve. Technologies are improving constantly but are still outpacing markets. Recycling is a fledgling industry, and long-term commitment, regulation, and industry acceptance will likely improve the markets and technologies in the future.

The region believes that recycling and waste-to-energy (WTE) are mutually supportive of each other. An important assumption, however, is that feedstocks for WTE plants need to be clean and consistent. The region does not support “mass burn” incineration of MSW. In that regard, pre-treatment is necessary in order to prepare a feedstock for a WTE facility. The best way to accomplish the quality control needed to produce the consistent feedstock is to have a MRF on the front-end of the system. There is a significant cost associated with building and operating a MRF, so the MRF needs to be designed so as to recover materials in a manner that will provide the highest financial return on investment. In that regard, PEF should never be the primary product, because it will likely be sold on a BTU basis that is pegged to wood or similar biomass fuels. That is, PEF will likely bring around \$20 to \$30 per ton. For the same amount of processing, cardboard typically brings around \$40 to \$100 per ton, office paper typically brings around \$100 to \$150 per ton, and #1 and #2 plastics generally bring \$300-400 per ton. Obviously, it is more profitable to recover materials for traditional markets rather than recovery for energy. Therefore, the region believes in energy recovery because of the costs involved in collection and transportation of traditional recyclables, not because PEF will bring more money in than other traditional recycling markets. In order to keep

recyclables clean and acceptable for markets, they must be free of contamination. Cardboard boxes with Styrofoam packing materials still inside, for example, are not recyclable in traditional markets. Regional governments covered by this Plan believe that during the process of recovering materials for recycling, there will be a point at which the extra gain is not worth the extra strain. Therefore, rejects and residuals from the recycling stream should be converted to fuel. This fuel, called PEF, provides for a small revenue source while keeping materials out of the landfill. Most MRFs have a cost associated with landfilling the rejects, but PEF produced in the TRSWA system should bring in a source of revenue. This addition to the MRF should make recycling profitable rather than costly; thus, the profits will drive greater participation and recycling.

After sixteen years of experience with various recycling programs in the region, it is believed that much higher citizen participation can be achieved through single-stream collection of commingled recyclables. Commingled materials can be compacted at the convenience centers, so exorbitant transportation costs associated with uncompacted, source-separated materials can be avoided. The negative side of compaction is that materials will not be as clean. It is these “contaminated” materials that will become feedstock for PEF. Cleaner materials will be removed at the regional MRF on the sorting line before they get to the PEF line.

The region supports legislation that would include the “non-fossil biogenic” portion of MSW as qualified “renewable biomass” in order to receive various benefits from alternative energy programs on the state and federal level. Most current legislation on the federal level includes verbiage that excludes any and all MSW from being considered as a source of “renewable biomass.” Biomass is a source of alternative energy and is generally considered to be “carbon neutral,” that is, the same amount of carbon released by the thermal conversion of these materials is taken up by the plants that produce the biomass, so there is no net addition of carbon to the air as is the case with fossil fuels. TRSWA believes that including the “non-fossil biogenic portion” of MSW in the definition of renewable biomass will serve to improve the economics of recycling and will also greatly reduce greenhouse gas emissions.

Generally speaking, a MRF has a capital cost of between \$40 and \$100 per annual ton processed, depending on the level of processing sophistication employed. That is, a 400 ton per day (104,000 ton per year) MRF could cost between \$4 million and \$10 million to build. This figure can change dramatically depending on the amount of automation and the quantities and qualities of the products produced. Operating costs have a direct correlation to capital costs, because highly automated systems require little labor, while some MRF's can employ as many as 40 people per conveyor line. In this region, it appears that MRFs will represent the most viable route for reaching reduction and recycling goals in a cost-effective manner. By incorporating a MRF design that recovers PEF as an additional recyclable commodity, capital and labor costs are reduced. Capital costs are reduced because, while automation is necessary to produce the PEF, the amount of automation required for PEF production is less than the capital requirements for automated separation of traditional recyclable commodities. For traditional MRFs,

there is a point at which recovery and processing of materials for traditional recyclable markets is no longer worth the capital investment, and at that point the MRF designer must choose to either 1) install expensive separations equipment, 2) employ additional labor, or 3) pay to dispose of the residual. In most case, the last option is chosen because it is least expensive. In the TRSWA model, most of the residual can be diverted into the PEF line instead of the landfill.

There is a publicly owned and operated MRF in North Augusta that processes recyclables from North Augusta, Augusta (Georgia), Aiken, Edgefield, Johnston, Trenton, and McCormick. That MRF is capable of expanding. Unfortunately, the location of the MRF is not ideal for the entire region, and analyses and discussions are ongoing as to the possibility of utilizing that MRF for all or part of the entire region. There is a MRF in Barnwell County that processes materials from Barnwell, Bamberg, and Allendale counties. Currently, the region is planning to build a MRF at the site of the regional Landfill on the Savannah River Site. The region is committed to the notion of using MRFs as a process for recovering and marketing recyclables. Most studies indicate that curbside recycling and processing programs are less productive and more expensive than MRFs, and the region's policymakers are not supportive of any programs that will result in anything but the most cost-effective solutions.

The current plan is to continue to promote source separation at curbside, commercial and industrial generation points, and at convenience centers. Source separated materials will be processed (usually baled) at RMBOs and sent directly to markets. Residual materials from the source separation systems, plus rejected recyclables (those materials that have some recycling value but are mixed, contaminated, or otherwise unsuitable for high-end markets) will be sent to the Materials recovery facility (MRF) at the regional landfill. Additional separations will take place at the MRF but the majority of material from the RMBOs, once it reaches this facility, will be converted into process-engineered fuel (PEF).

For materials recovered at MRFs, SCDHEC reports the following information as a typical market “snapshot” though actual market prices fluctuate greatly:

ITEM	PRICE/TON
ONP	\$20 F.O.B. MRF
OCC	\$45 F.O.B. MRF
Magazines	\$15 F.O.B. MRF
Phone Books	\$10 F.O.B. MRF
HDPE	\$300 F.O.B. MRF
PETE	\$300 F.O.B. MRF
Steel Cans	\$60 F.O.B. LEXINGTON
Aluminum Cans	\$1000 F.O.B. MRF
Clear Glass	\$20 F.O.B. LAURENS
Brown Glass	\$10 F.O.B. LAURENS
Green Glass	\$5 F.O.B. LAURENS

The **Barnwell County MRF** is smaller than the North Augusta MRF. It will expand in the coming years, and will take on more materials from Bamberg and Allendale counties, in addition to Barnwell recyclables. The Barnwell MRF is similar in scope to the Recovered Materials Baling Operations (RMBO) (see 7.3.2 below) in the region in that it processes materials already source-separated. With improvements, Barnwell can do some additional separations at its facility.

Recycling programs in some municipalities have been designed to reduce the end-disposal amounts of waste. Some private haulers also provide recycling programs. In practice, the isolated improvements made by individuals or neighborhoods have had only nominal effect on the overall waste stream management and, thus, on transportation considerations. Recycling of specific waste streams at industrial locations has a greater impact on transportation needs, and reducing volumes through in-house use or re-use has even greater implications. The Region is investigating numerous methodologies for improving the rate of waste reduction and diversion. It is the policy of the Authority that any regional approach that is managed by the Authority must be based on the following assumptions and objectives: 1) that any meaningful reduction and recycling plans must be simple enough to be implemented by a large percentage of MSW generators, thereby creating an economy of scale; 2) that source separation and diversion of select materials is an effective recycling/diversion method; 3) that industry holds the most promise for cost-effective recycling/diversion of the greatest volumes of materials; and 4) that processing at MRFs or Recovered Materials Processing Facilities must allow for some commingling (contamination) of dissimilar materials as a natural consequence of typical solid waste collection and disposal systems; 5) that this commingling of materials allows for a less costly recovery of a greater quantity of the overall waste stream; and 6) that there is flexibility built into the system so that improvements can be implemented as technology improves.

**COUNTY RECYCLING EFFORTS**

Table 7-1

County	FY2008 Disposal Amount (Tons) Total all landfills and incinerators	FY2008 Total Recycling	FY08 Recycling Rate (35% Goal)	
			Actual Recycling Rate	Goal Met
Aiken	281,680	61,178	21.7%	No
Allendale	10,952	1,148	10.8%	No
Bamberg	12,424	1,498	12.1%	No
Barnwell	88,975	9,291	10.4%	No
Calhoun	17,184	1,839	10.7%	No
Edgefield	43,854	19,085	43.5%	Yes
McCormick	7,769	2,520	32.4%	No
Orangeburg	363,841	26,886	7.4%	No
Saluda	21,608	8,644	40%	Yes

COUNTY REDUCTION EFFORTS

Table 7-2

County	FY93 Disposal Amount (Tons) Base	FY93 Population Base	Per Capita Generation (Tons) Base vs. Goal		FY08 Reduction (3.5 lbs/person/day Goal)		
			FY93	Reduction Goal	FY08 Per Capita Generation Rate (Tons)	Actual Reduction Rate	Goal Met
Aiken	118,445	120,940	0.98	0.65	0.68	-3%	No
Allendale	8,671	11,722	0.74	0.86	0.51	48%	Yes
Bamberg	12,744	16,900	0.75	0.85	0.68	23%	Yes
Barnwell	18,170	21,017	0.86	0.74	0.76	-2%	No
Calhoun	12,265	12,753	0.96	0.66	0.56	11%	Yes
Edgefield	16,045	19,290	0.83	0.77	0.61	19%	Yes
McCormick	7,244	8,827	0.82	0.78	0.41	45%	Yes
Orangeburg	85,290	87,021	0.98	0.65	0.75	-10%	No
Saluda	11,347	17,000	0.67	0.96	0.59	55%	Yes

In most cases, Specific wastes are recycled. These materials are listed in Section 7.7. With the exception of “white goods” and metal, regional governments receive little revenue from the sale of specific wastes. The financial savings comes in the form of avoided landfill costs. Also, many of the specific wastes are banned from landfill disposal, so there is an environmental benefit that is not calculated in dollars saved.

**7.3.2 Recovered Materials Baling Operations**

There are currently three Recovered Material Baling Operations (RMBOs) in the region. These facilities take material separated (recovered) from the county’s drop off sites, perform some nominal separations, and bale the materials for sale. The locations of these facilities are: Aiken County at the Barden landfill, Tri-County at the Transfer Station, and Orangeburg County at the Transfer Station. Aiken County reports the following information regarding its recovered materials:

### 7.3.3 Private Recycling Efforts

Recycling activity in the region has been surveyed and assessed. Geographic location and waste handling capacity of all known, privately operated separation facilities, processors, packagers, and transporters are as follows:

**Private Recycling Efforts  
Table 7-3**

FACILITY	LOCATION	TYPE	MATERIALS
Climax Global Energy	Allendale	Processor	Plastics
Commercial Metals Company (CMC)	North Augusta	Processor	Automobiles
Gloverville Box & Pallet	Gloverville	Processor	Pallets
RNM Industries	Aiken	Processor	Pallets & other lumber
Toner Charge	North Augusta	Manufacturer	Toner cartridges
B. F. Goodrich	Williston	Processor	Drums
Start Fibers	Edgefield	Processor	Plastics
Faith Group Co., Inc.	Edgefield	Processor	Plastics, nylon
Ridge Recyclers	Johnston	Processor	Tires
Orangeburg Recycling	Orangeburg	Processor	Aluminum, copper, radiators, aluminum cans (non-ferrous)
Sun Printing	Orangeburg	Processor	Paper products, cardboard
Sunshine Recycling	Orangeburg	Processor	Aluminum, copper, radiators, aluminum cans (non-ferrous)
Regional Recycling, LLC	Orangeburg	Processor	Scrap Metal
North 301	Orangeburg	Processor	Aluminum, copper, brass, radiators, other non-ferrous metals
Global Investment Recovery	Salley	Broker	All types of electronic equipment
Energis	Holly Hill	Processor	Coal Ash
Carolina By-Products (Valley Proteins)	Branchville	Processor	Meat byproducts, grease traps
Georgia-Pacific Fiberboard	Holly Hill	Processor	Wood chips
Carolina Recycling	Batesburg	Processor	Fluorescent lights, white good, HDPE, PET
Valley Proteins	Ward	Processor	Meat byproducts, grease traps
Gro-Bark	McCormick	Processor	Timber mill bark
Fire Departments	Contact local FD for participation		Aluminum Cans

**7.3.4 Drop-off sites** are staffed collection areas, often called Convenience Centers, where public education and facilities upkeep are emphasized. All member counties have operating, staffed drop-off sites. At the drop-off centers, employees greet citizens and interact in such a way so as to educate and encourage recycling. Separate bins and areas are set up to allow people to deposit materials according to type. A compactor is used to reduce the volume of non-recyclables prior to further transportation. Recommended daily volumes are between 5 to 10 tons. Citizens have the option of separating recyclables, or disposing of total MSW without separating. TRSWA recommends that counties also equip each Drop-Off site with a compactor for commingled (single stream) recyclables, or alternatively, implement a “blue bag” system so that recyclables can be co-collected in one compactor and separated later at a transfer station or MRF. It is recommended that incentives be devised in addition to constant education programs, in order to promote recycling. MSW is transported directly from the drop-off site to the transfer station, and recyclables are transported to processing facilities and/or markets.

The governments of the region have constructed drop off sites that are available to all citizens living in the region, whether residing in incorporated or unincorporated areas. The only restrictions are that the users must reside in the county in which the drop off site is located and no industrial or commercial MSW is allowed. Though often misunderstood, these sites are fully accessible by residents of incorporated areas, even if their municipality provides other means of collection. Also, the drop off sites are not intended to be the sole method of collection and disposal for individuals, but are merely intended to serve as a convenience; hence the term “Convenience Center” is often used to describe these sites. The governments of the region prefer and encourage private citizens to contract with private haulers for curbside or streetside collection of MSW.

<b>Drop-Off (Convenience) Sites Per County</b>	
Aiken	10
Allendale	5
Bamberg	8
Barnwell	9
Calhoun	9
Edgefield	8
McCormick	4
Orangeburg	21
Saluda	7
<b>Region Total</b>	<b>81</b>

Drop-off sites generally cost \$60,000 to \$100,000 each to construct and \$50,000 per year to operate. Each drop-off site must be staffed, and they are generally open five days a week from around 7 a.m. to 7 p.m.



### **7.3.5 Curbside Collection**

Curbside source separation is currently being practiced in the following communities: Aiken, North Augusta, Johnston, Saluda, and McCormick. It is assumed that municipal pickup will continue as in the past. Municipalities with curbside pickup take their separated MSW directly to MRFs.

Most commercial MSW is picked up by private haulers. This practice will continue, with the haulers taking the wastes to the Transfer Stations, MRFs, the Regional Class 3 landfill, or Class 2 landfill sites. Some generators also haul their own MSW. The Region will encourage these haulers and generators to utilize the facilities established for recycling, with government-operated facilities providing financial incentives or disincentives for private participation.

## **7.4 Waste to Energy Plants**

Generally, “waste-to-energy” is the term used to reference facilities that are built to incinerate unprocessed MSW on a mass scale. A regional facility producing 25 megawatts of electrical power could be built to extract the usable energy from approximately 450 tons per day of high-BTU MSW. The region does not support a mass burn facility at this time. However, TRSWA is developing a program to manufacture a process-engineered fuel (PEF) that could be sold to energy producers who have boilers or other energy-producing units suited for such material. Three Rivers is investigating the idea of developing a public-private partnership at the regional landfill site or at a nearby location, utilizing solid fuel produced at the PEF facility, plus landfill gas. The Authority could decide to develop and implement this idea on its own.

Waste-to-energy plants are facilities that use waste materials to produce energy. Forms of energy normally produced from MSW include steam and electricity. WTE plants that produce liquid (vehicle) fuel, hydrogen, and syngas, in addition to steam and/or electricity, are presently in the development stages. As a practical matter, when developed, they may be referred to as something other than “Waste-to-Energy,” and the term “waste transformation” may be a better description of the process. Waste Transformation is lumped together with WTE in this Plan for ease of discussion. If such technologies present themselves in an environmentally, operationally, and financially sound form, the Authority could become a partner in such a project, that would be considered a waste-to-energy facility, though not a mass-burn facility.

Synthesis gas (syngas) is the term used to describe the product derived from the synthesis of solid, carbon-based materials through thermal conversion, in the absence of oxygen. Thermal conversion in the presence of oxygen would generate a flame, or incineration. Syngas is made up of carbon dioxide (CO<sub>2</sub>), carbon monoxide (CO), and hydrogen (H<sub>2</sub>). Syngas has a relatively low Btu value, but its conversion to energy is cleaner and more efficient than combustion processes.

TRSWA is investigating gasification technologies that may increase the efficiencies of PEF utilization, where applicability in gas-fired boilers may be more economical than solid fuel

boilers. PEF produced at the TRSWA MRF should be capable of producing a much larger volume of gasifier feedstock at a lower cost when compared to producing a solid fuel that would be co-fired with wood or coal. Because of recent changes in national and local energy policy, TRSWA is analyzing the use of PEF as a feedstock for gasification, then combining the syngas with landfill gas (LFG) to produce energy. TRSWA feels that it could combine MSW with other forms of “biomass” to process between 500 and 3000 tons per day of solid fuel that could be gasified, depending on supplies of other carbon-based materials from local farmers and foresters. TRSWA could utilize some of the electricity produced, and sell the remainder on the grid. TRSWA should look into industries that could co-locate and utilize steam. DOE has an incentive to purchase green or renewable power. Some of this green energy may be in the form of liquid fuel. Similarly, MSW digestion could be utilized to produce biogas.

## 7.5 Composting

The Solid Waste Management Act of 1991 requires that no Class 3 landfill will accept yard wastes and debris beginning May 27, 1993. Composting is encouraged. As with recycling, finding a market for composted materials is of principal concern, although technical considerations are not to be underestimated.

In the past, TRSWA has owned equipment and managed the operations involved with grinding and composting approximately 10,000 tons of pallets per year. In the past, TRSWA composted these ground pallets and irrigated with leachate in a designated area inside the active portion of the landfill. The ground pallets were blended with wastewater treatment sludge (biosolids) from Aiken County Publicly Operated Treatment Works (POTW), Horse Creek Treatment Facility. TRSWA is investigating the possibility of reviving this program with inclusion of other materials, specifically food waste, cellulosic materials and wastewater treatment sludge. Composting will be evaluated with waste-to-energy, including anaerobic digestion, in order to determine the best technology for the region as a whole. It is the region’s goal to divert fifty percent (50%) of the region’s MSW to recycling markets, composting, and/or waste-to-energy facilities.

Composting is more difficult and technical than many people understand, but the technology is readily available. Composting sites require approximately 10 acres of land that, at a minimum, would cost \$50,000 to purchase and prepare. There are several regulatory requirements as to buffers, grading, water tables, etc., that, when added to other necessary land improvements, will probably add another \$50,000 to the cost. Other cost estimates follow:

A)	Front end loader	\$ 75,000
B)	Water tank truck	65,000
C)	Specialized aerating & turning equipment	200,000
D)	Grinder -	<u>300,000</u>
	<b>TOTAL</b> (including above)	\$640,000

Operations costs for a composting facility are estimated at between \$4 and \$8 per cubic yard. A 100 cubic yard/day facility, therefore, is estimated to incur approximately \$100,000 to

\$200,000 per year for operating costs. Depreciation of capital items adds an additional \$4 to \$8 per cubic yard. No costs for collection and transport are included in this estimate.

Markets for compost are questionable at this time. There is no doubt that compost would add a significant value to much of the soil in this region. Once the value and markets are established, compost should bring about \$10 per cubic yard. The facility outlined above might be able to expect gross revenues of \$300,000/year, and that facility could likely supplement its supply of feedstock from agricultural wastes that are abundant in this area. These revenues can be supplemented by charging a tip fee of around \$5 per cubic yard. It is likely that private entities would be interested in taking on all or part of the composting responsibilities. In addition to yard waste and land clearing debris resulting from municipal operations, there are a number of other waste materials available, including vast amounts of agricultural wastes.

Cost savings are realized by the sharing of equipment among all facilities in the region. The volumes of compostable waste in all instances here would not support the use of dedicated machinery, as listed above, at each site. Almost all of the equipment necessary could be loaded onto trailers and moved, perhaps on a weekly basis, among the ten sites in this region. The TRSWA Board has expressed an interest in providing this type of service if enough sites could be dedicated to support the cost of equipment and operations.

Composting can be successful on a small scale, also, if individuals are motivated to do so. The region supports backyard and community composting.

## **7.6 Landfilling**

Any waste management plan ultimately includes the use of landfills. At present, it is concluded that this region should only support one Class 3 (Subtitle D) landfill, and this landfill may be expanded through modification of final elevation design. Several Class 2 landfills in the region are used for disposal of inert materials that do not need placement in a Subtitle D landfill, and these Class 2 landfills may be expanded through modification of final elevation design. The region supports additional Class 1 landfills and non-merchant (non-commercial) Class 2 landfills used solely for the disposal of industrial waste generated by the owner in the course of his manufacturing or industrial operations.

### **7.6.1 C&DLCD materials and Class 2 Landfills**

The counties of Aiken, Bamberg, Barnwell, Calhoun, and Orangeburg have converted their C&DLCD landfills to the appropriate new Class 2 landfill designation. These facilities currently dispose yard waste and construction debris, but the region encourages the recycling of C&DLCD materials, and many of these materials can be recovered for energy.

There are currently eighty-one (81) drop off sites operated by the counties in the region. At each site, a separate bin is available for residents to dispose of yard trimmings and land clearing debris. In this way, these materials are directed to the Class 2 landfill

rather than having the materials mixed in with MSW. Additionally, at the four (4) MSW Transfer stations, loads containing excessive amounts of yard trimmings and/or land clearing debris are rejected and directed to the Class 2 landfill.

The region does not support any new Class 2 landfills, except for non-merchant (non-commercial) industrial landfills used solely for the disposal of industrial waste generated by the owner in the course of his manufacturing or industrial operations. The counties of Edgefield, McCormick, and Saluda, cooperating through the auspices of Tri-County Solid Waste Authority, will close their Part IV C&DLCD landfill and will divert inert buriabiles to private facilities or the regional Class 3 landfill. The region also supports expansions of existing Class 2 landfills through modification of final elevation design.

<b>Yard Waste &amp; Debris Disposal or Treatment Locations</b>		
<b>Area</b>	<b>Locations</b>	<b>Type</b>
Aiken	2	Class 2 Landfill
Bamberg	1	Compost/Class 2 Landfill
Barnwell	1	Class 2 Landfill
Calhoun	1	Class 2 Landfill
Orangeburg	2	Class 2 Landfill
SRS	1	Compost/Class 2 Landfill

**7.6.2 Subtitle D Landfill**

Subtitle D of the Federal Resource Conservation and Recovery Act makes landfilling of MSW complex as well as expensive. Among the issues that must be addressed are 1) location restriction, 2) design criteria, 3) operating criteria, 4) closure and post-closure care, and 5) financial assurance.

The region believes that one and only one MSW (Class 3) landfill should be operated in the nine-county area. That landfill has been operating since 1998, located on the Savannah River Site. Its life expectancy at current usage is approximately 100 years.

The capital cost for building the regional Subtitle D landfill today is usually between \$200,000 and \$500,000 per acre. Operational costs are about \$20 per ton of material that is buried, not including collection and transportation costs. Three Rivers Solid Waste Authority charges its member counties and DOE-SR a rate of \$35.70 per ton for transportation and disposal of MSW. This rate is approximately 15% below the average for like services paid by other counties in South Carolina. South Carolina’s average is near the lowest reported from any state in the country. Therefore, it is safe to assume that the counties in the Three Rivers region are paying among the lowest prices in

the country for MSW transport and disposal. More analysis follows in Section 9.0 of this Plan. However, the more important indicator is the “cost per capita.” If the Waste Management Hierarchy is followed and tonnage is reduced, the cost per ton could go higher, and the cost per capita could go lower. Overall (total) costs are lower. According to annual reports submitted to SCDHEC, the cost per capita for all solid waste services in the TRSWA region are around \$45 versus \$67 for the state as a whole.

The region desires to limit disposal of MSW to no more than one landfill, with an annual tonnage limitation of 500,000 tons. In an effort to reduce costs, the region supports expansion of the Authority’s Regional Subtitle D (new designation Class Three) MSW Landfill through a modification of its current final elevation design.

This region disposes of around 250,000 tons of MSW per year today. Uncompacted, each ton represents about 1.5 cubic yards, and the region's MSW could be expressed as being 340,000 cubic yards per year.

TRSWA is exploring the notion of converting some or all of its regional MSW landfill to allow for recirculation of leachate into the landfill in order to facilitate an active biodecomposition of the waste. The ultimate goal would be 1) reduce costs and environmental impact associated with current leachate treatment practices, 2) reduce the amount of airspace required for disposal therefore extending the life of the facility, and 3) reduce the overall potential for environmental impact caused by the landfill by converting the wastes into more inert materials. The region believes that volume reduction and waste stabilization of organic materials can be accomplished in an environmentally sound and cost effective manner, and the Authority plans to implement systems for utilizing the best technologies to accomplish that end.

The Authority also plans for a re-design of the finished elevations for the Subtitle D landfill. This re-design would add more space in the landfill, thus accommodating more waste at less cost per ton. Life expectancy would also increase.

If the composting and/or waste-to-energy facilities divert 400 tons per day (100,000 tons per year), the region will still generate approximately 170,000 tons per year of MSW for landfilling. In order to operate a landfill in a cost-effective manner, the Authority determined that a minimum of 157,400 tons per year is needed. Therefore, diversion of up to 50% of the wastestream (after source separation of recyclables) could be accomplished with minimum negative impact to the landfill operations. The region has always maintained that one of the primary purposes of regionalization is to benefit from economies of scale in all waste management operations. In effect, by combining the MSW of the entire region, the Authority then has the ability to “do the right thing” environmentally, which is to divert the maximum amounts into recycled products, without negative impact to its overall operations. This financial planning is essential so that the Authority and the region can remain financially responsible and competitive. Many programs have failed around the country because services provided became fragmentalized, and the planners did not stick to a comprehensive plan. Consistent with

the South Carolina Solid Waste Policy and Management Act (SC SWPMA), the Regional Plan emphasizes the role of the Authority as the central planning agency so that TRSWA can develop a comprehensive plan that addresses the many considerations, including financial, socio-political, health, safety, and environmental concerns.

<b>SUBTITLE D LOCATIONS</b>	
<b>Area</b>	<b>Subtitle D Locations</b>
Barnwell/Aiken County line on SRS	1

### **7.6.3 Industrial Landfills**

Industrial landfills are regulated according to rules set forth in Regulation R.61-109.19, effective May 23, 2008.

### **7.7 Specific Wastes**

Specific wastes include lead-acid (vehicle) batteries, used oil, tires, large appliances (known as white goods), yard waste (leaves and limbs), and land-clearing debris (woody materials). All counties in this region recycle lead-acid batteries, used oil, tires, and large appliances. Yard waste and land-clearing debris can be disposed in private landfills and generally are in this region. Grinding and composting of these materials is preferred, and that activity qualifies as recycling. Recycling for energy recovery is also an option.

Specific wastes are discouraged and often banned from disposal in an MSW landfill by the Act. Presently, all of the Authority’s member counties are accepting these specific wastes, but they are being disposed of or recycled separately from the other MSW. Grant monies for tire disposal have been the catalyst for cleaning up waste tires. Networks are being established by private handlers for some of these products. The counties and the Authority handle shipping pallets as a specific waste, though pallets are not banned from disposal in landfills.

Other examples of miscellaneous specific waste collected for recycling are as follows: 1) antifreeze, 2) consumer electronics, 3) cooking oil, 4) fluorescent tubes, 5) food waste (post-consumer), 6) hazardous household materials (solvents, aerosols, etc.), 7) latex paint, 8) mattresses, 9) textiles, 10) toner cartridges, 11) used oil bottles, 12) used oil filters, 13) wood packaging ( primarily pallets and shipping materials), and 14) other wood (forestry, agricultural, and building residual). The Authority encourages counties to consider collection and marketing cost/benefit analyses for each of these materials. Because they cause problems in other handling areas, the Authority especially encourages the removal of all of these listed miscellaneous items. The Authority encourages legislation and other incentives and disincentives that may prompt the proper management of these materials, including bulking at Solid Waste Processing facilities.

When marketing recyclables or specific wastes, cost is often the factor that determines the governments' preferred disposition of the material. An important factor to be considered in determining cost allocation is cost of collection and transport. In the transportation systems described in this plan, the following assumptions are made: 1) Residents in rural areas take MSW directly to drop-off sites in personal vehicles; 2) Vehicles that consolidate the MSW at drop-off sites, for transport to the transfer station or landfill, are vehicles with capacities of twenty to thirty-five cubic yards. Allowance is made, however, for pickup trucks, automobiles, stake-body trucks, and other collection vehicles as may be encountered on a day to day basis; 3) Over-the-road transport trucks are diesel powered tractor-trailer rigs, with trailer capacity of at least ninety cubic yards. TRSWA provides over-the-road transport from transfer stations, utilizing "walking floor" trailers that can off-load directly onto the landfill disposal area.

## ITEMS BANNED FROM MSW LANDFILLS

**Table 7-4**

Banned Item	Effective Date
Lead-Acid Batteries	May 27, 1992
Used Oil	May 27, 1992
Yard Trash & Land-Clearing Debris	May 27, 1993
Whole Waste Tires	October 23, 1993
White Goods	May 27, 1994
Small-Sealed Lead-Acid Batteries	June 23, 1995

### **7.7.1 Used Oil**

Santee Cooper collects all used oil collected at GOFER (Give Oil For Energy) sites. Waste oil heaters are utilized at rural fire stations, county maintenance shops, and other county or TRSWA facilities.

## Current Regional County GOFER Sites

### Aiken County

- **Belvedere**, 537 Edgefield Road, Belvedere
- **Langley**, 458 Huber Clay Road, Langley
- **New Ellenton**, 2120 Williston Road, Aiken
- **Graniteville**, 214 Bettis Academy Road, Graniteville
- **Reynolds Pond**, 1491 Reynolds Pond Road, Aiken
- **Windsor**, 102 Cedar Road, Windsor
- **Perry**, 270 Center Street E, Highway 14, Perry
- **Couchton**, 240 New Holland Road, Couchton
- **New Holland**, 121 Chalk Bed Road, New Holland
- **Monetta**, 118 Trojan Road, Monetta

**TOTAL GALLONS COLLECTED IN AIKEN COUNTY, FY 2008 = 46,537**

### Allendale County

- **Allendale**, 105 Miles Road, Allendale
- **Sycamore**, 139 Long Pond Road, Ulmer
- **Appleton**, 506 Gill Road, Allendale
- **Martin**, 7601 Augusta Highway, Martin
- **Barton**, 1485 Terry Road, Fairfax

**TOTAL GALLONS COLLECTED IN ALLENDALE COUNTY, FY 2008 = 2,923**

### Bamberg County

- **Landfill**, 15 Landfill Road, Denmark
- **Govan**, 20954 Ehrhardt Road, Olar
- **Colston**, 2636 Colston Road, Bamberg
- **Hunters Chapel**, 6349 Farrells Road, Branchville
- **Pitt Road**, 1211 Pitt Road, Denmark
- **Midway**, 7747 Heritage Highway, Bamberg
- **Rivers Bridge**, 739 St. Johns Church Road, Ehrhardt
- **Public Works**, 1785 Braxton Bridge Road, Bamberg
- **Adult Development Center**, 16553 Heritage Highway, Denmark

**TOTAL GALLONS COLLECTED IN BAMBERG COUNTY, FY 2008 = 3,985**

### Barnwell County

- **Long Branch**, 1320 Orchard Road (S6-118), Barnwell
- **Hwy 3**, 6640 Highway 3, Barnwell
- **Snelling**, 1359 Seven Pines Road, Snelling
- **Healing Springs**, 3287 Healing Springs Road, Blackville



- **Landfill**, 155 Landfill Road, Barnwell
- **Reedy Branch**, 870 Reedy Branch Road, Hilda
- **County Public Works Department**, Calhoun Street, Barnwell
- **Rosemary**, 963 Thorin Drive, Williston
- **Fire Tower**, 7633 Hwy 64, Barnwell
- **Spur Branch**, 8360 Springfield Highway, Williston
- **Barnwell County Shop**, 48 Ammie Avenue, Barnwell

**TOTAL GALLONS COLLECTED IN BARNWELL COUNTY, FY 2008 = 8,568**

Calhoun County

- **Belleville**, 68 Hammonds Crossroads, St. Matthews
- **Creston**, 25 Hutto Pond Road, Cameron
- **Fort Motte**, 954 True Blue Road, St. Matthews
- **Midway**, 34 Blue Jay Court, Elloree
- **Riley Road**, 43 Riley Road, St. Matthews
- **Kennerly Road**, 97 Kennerly Road, North
- **Landfill**, 112 Purple Martin Drive, St. Matthews
- **Sandy Run**, 9507 Columbia Road, Swansea
- **Stumphole**, 335 Old River Road, Elloree
- **Cameron**, 671 Church Camp Road, Cameron

**TOTAL GALLONS COLLECTED IN CALHOUN COUNTY, FY 2008 = 7,077**

Edgefield County

- **#1 Site**, 1225 Columbia Road, Johnston
- **#2 Site**, 166 Georgia Road, Edgefield
- **#3 Site**, 652 Yonce Pond Road, Johnston
- **#4 Site**, 1067 Meeting Street Road, Edgefield
- **#5 Site**, 41 Rest Master Lane, North Augusta
- **#6 Site**, 540 Highway 378 West, McCormick
- **#7 Site**, 64 Greenhouse Road, Trenton
- **#8 Site**, 2111 Edgefield Road, Trenton
- **Aiken Electric Co-op**, Hwy. 25 Bypass

**TOTAL GALLONS COLLECTED IN EDGEFIELD COUNTY, FY 2008 = 11,570**

McCormick County

- **#1 Site**, 1471 South Main Street, McCormick
- **#2 Site**, 10903 SC Highway 28 South, Modoc
- **#3 Site**, 548 Lost Wilderness Road, Clarks Hill
- **#4 Site**, 129 Old School Road, McCormick

**TOTAL GALLONS COLLECTED IN MCCORMICK COUNTY, FY 2008 = 2,164**

Orangeburg County

- **Glover Street**, 490 Glover Street, Orangeburg
- **Ruf Road**, 221 Ruf Road, Orangeburg
- **North Road**, 4028 North Road, Orangeburg
- **North**, 8338 North Road, North 29112
- **Branchville**, 138 Miley Road, Branchville
- **Norway**, 328 Somerset, Norway
- **Neeses**, 278 Neeses Camp Road, Neeses
- **Branchdale Highway**, 1803 Branchdale Highway, Holly Hill
- **Big Oak Drive**, 185 Big Oak Drive, Holly Hill
- **Springfield**, 330 Skyland Drive, Springfield
- **Elloree**, 303 Midway Road, Elloree
- **Bowman**, 211 Adam Street, Bowman
- **Bozard Road**, 580 Bozard Road, Orangeburg
- **Eutawville**, 848 Sandspoint Street, Eutawville
- **Santee**, 3311 Old State Road, Santee
- **Site Road**, 140 Site Road N, North
- **Sturkie Road**, 866 Sturkie Road, Orangeburg
- **Cordova**, 1096 Blewer Road, Cordova
- **Rowesville**, 212 Calhoun Street, Rowesville
- **Woodford**, 1181 Lightning Hill Road, Woodford
- **Five Chop Road**, 7223 Five Chop Road, Santee
- **Landfill**, 310 Endicott Court, Orangeburg

**TOTAL GALLONS COLLECTED IN ORANGEBURG CO., FY 2008 = 22,626**

Saluda County

- **#1 Site**, 3313 Columbia Highway, Leesville
- **#2 Site**, 816 Batesburg Highway, Saluda
- **#3 Site**, 478 Neighbors Road, Ward
- **#4 Site**, 1672 Greenwood Highway, Saluda
- **#5 Site**, 138 Bethany School House Road, Saluda
- **#6 Site**, 106 Albert Smith Road, Batesburg
- **#7 Site**, 589 J. Paul Road, Johnston

**TOTAL GALLONS COLLECTED IN SALUDA COUNTY, FY 2008 = 7,706**

**TOTAL GALLONS COLLECTED IN REGION, FY 2008 = 113,156**

**CURRENT REGIONAL CAPACITY: 200,000 GALLONS PER YEAR**

### **7.7.2 Used Oil Filters**

TRSWA has placed over 200 large plastic containers throughout the region for use by citizens as receptacles for used oil filters. County vehicles periodically collect these filters and take them to a processing facility. The filters are processed by removing the rubber gasket and then placed into small crushers. The filters are crushed into a “puck” while simultaneously draining oil so it can be recycled into fuel. The puck is then placed with other scrap metal for sale.

### **7.7.3 Used Oil Bottles**

As with used oil filters, TRSWA has placed over 200 large plastic containers throughout the region for use by citizens as receptacles for used oil bottles. Counties also collect these bottles and takes them to either the North Augusta Materials Recovery Center or to the Barnwell County Recycling Center. Made of high-density polyethylene with a high recycle value, these bottles are processed through a grinding mill and shipped to an end market. As with the oil filters, residual oil is collected from the used bottles for use as fuel.

### **7.7.4 Waste Tire Disposal**

The Solid Waste Policy and Management Act of 1991 requires the separation of waste tires from the solid waste stream and disposal of tires in DHEC-approved processes and sites. In Section 44096-170 (D) the Act states that “Each county will be required by the department to participate in ongoing waste tire clean-up enforcement efforts.” Tires are defined in the Act as passenger and truck tires as defined in Section 56-3-20(2), (4), and (13) with “DOT” stamps, not off-road, small implement (golf car, lawn mower, etc.), or agricultural tires. Therefore, only passenger and truck tires are affected by the regulations as they pertain to counties and municipalities.

Since November 1, 1991, any new tire purchased at the retail level has an added \$2.00 charge that is to be used for waste tire disposal. The South Carolina Department of Revenue (DOR) collects the \$2.00 fee and refunds \$1.44 to the counties for disposal of tires. The counties use this money to pay for tire cleanups and related costs. The counties generally spend more in a year than they receive from the DOR, in which case they receive a reimbursement for the overage from one of the grants administered by the Authority. Only direct costs are reimbursed, and counties must “participate in ongoing waste tire clean-up enforcement efforts” at their own expense. These expenses include the collection of waste tires at designated drop-off sites, associated transportation, administrative work, and enforcement of the various handling and administrative issues related to the public’s efforts related to disposition of waste tires. To partially offset these costs, counties may charge for waste tires that are not otherwise accounted for through one of the programs outlined below. Additionally, counties may charge any amount for no-DOT tires.

There are three basic tire programs with which the counties should be involved, plus there are two options available to South Carolina counties. They are as follows:

- 1) Dismantler program (required) – Almost any salvage yard is, or can become, eligible to be included in this program. This is essentially a low cost or “no cost” program to them and to the county. The dismantler is supposed to deliver passenger tires, off the rim, to a county designated place for pick-up. With each delivery, he is supposed to give the county copies of a DHEC Form 1 or a Form 2. Form 1 can only be accepted with a letter from DHEC that states that the dismantler is allowed “x” number of tires on that Form. Form 2 is for all other cases, and it simply lists vehicle identification numbers (VIN’s) with a maximum of 5 tires for each VIN allowed. It is the counties’ responsibility to count the tires and check the forms. The dismantler in all cases would be responsible for loading and delivering the tires.
- 2) The second (required) program is the “waste tire grant” program. Under this program, someone (normally the county) notifies the local DHEC EQC office of an illegal pile. If DHEC approves the project, the county will determine how the tires will be removed and recycled, presumably through a competitive bid process. The county then requests reimbursement or direct costs against its “Waste Tire Grant.”
- 3) The third (required) program is the “county tire program.” Under this program, the counties may accept tires at no charge under either of two circumstances: a) It can be proven by the person delivering the tires that they paid the \$2 per tire recycling fee at the point of purchase; or b) in the case of a retailer, it can be proven that he remitted \$1.94 out of each \$2 collected at point of sale to the South Carolina Department of Revenue (DOR). In the case of (a), a bill of sale must be presented matching the number of tires being delivered. In the case of (b), the retailer must present an ST-390 form with the number of tires represented on the form(s) matching the number of tires delivered to the county. The counties are responsible for determining whether ST-390 fees have been properly paid, which usually means that a copy of the cancelled check is required. On June 30 of each year, the county is supposed to reconcile its receipts from SCDOR against its total costs for tire disposal/recycling associated with the “county tire program.” If the county has excess funds, it is supposed to apply these funds to expenses in future years. If the county has expended more than it received from SCDOR, it is supposed to let DHEC know the shortfall as soon as possible so that grant monies can be used to cover the shortfall. It has been the practice in his region for TRSWA to administer this grant program on behalf of the counties.
- 4) Another option (that is not required) is to allow individuals to deliver passenger tires at no charge to designated sites. It is generally the case that counties accept up to 4 passenger tires per individual at intervals determined by each county. If the county accepts these tires, it is the county’s responsibility to pay for and ensure proper recycling of the tire. DOR monies can and should be used to cover expenses. The DHEC waste tire grant will pay for any direct expenses beyond those covered by DOR monies.
- 5) Commercial accounts –The County may choose to receive tires from anywhere, including oversized or off-road tires, at any charge approved by the county council,

up to \$150 per ton for DOT tires or any charge for non-DOT (off-road) tires. Whether or not to offer this service is a political and business decision for the county.

Additionally, TRSWA and its member counties provide the following guidelines to the various parties involved:

- 1) Retailers – Retailers must charge \$2 per tire at point of sale. They have an option of a) remitting \$1.94 per tire to the State DOR and, therefore, establish a recycling credit for all tires sold or b) remitting \$.94 and keeping \$1 to pay directly for recycling their waste tires. Though it is their option, retailers who sell more than 15% truck tires should always choose to send in the \$1.94 per tire sold. From the county perspective, it is always better for the retailer to remit the \$1.94 per tire. That way, the dealer can simply show an approved hauler or recycling facility (or the county) its ST-390 form and copy of the cancelled check verifying remittance, and the recycler or county must take the number of tires corresponding to the number shown on the ST-390 form(s). A retailer who sells nothing but passenger tires may be able to remit \$.94 per tire and make a little money by paying the collection and recycling fees directly. However, in doing so that retailer assumes the responsibility for ensuring the ultimate legal disposition of the tire. In other words, if a retailer allows someone to remove his waste tires and those tires are ultimately illegally dumped, the retailer will be liable.
- 2) Used Tire dealers – Sometimes, those people who deal in the used tire business are called “Wholesalers.” These people do not charge \$2 per tire at the point of sale. They are responsible for paying 100% of any and all recycling charges. If a used tire dealer received his tires from a retailer, and paid the \$2 per tire at point of sale, the used tire dealer can provide a copy of his sales receipt to the hauler, recycler, or county and have the tires recycled at no charge. If a used tire dealer received his tires from a retailer and did not pay the \$2 per tire fee, that retailer is responsible for ultimate disposition of the tire. Therefore, the used tire dealer should coordinate with the retailer(s) from whom the tires came originally, and those tires can still be recycled by an approved hauler, recycler, or county through the same ST-390 reporting system described above. If the used tire dealer received his tires from someone other than a retailer, or otherwise received his tires without paying the \$2 per tire fee, the used tire dealer is responsible for all costs involved with legal disposition of the waste tires.
- 3) Individuals – Generally, individuals can bring up to 4 passenger tires per individual no more than once a month to the county collection center. Check with your county for current rules.
- 4) Property owner – If a property owner has tires that have been illegally dumped on his property, he should contact the local DHEC EQC office. The DHEC representative will visit the site and go through several investigative steps to determine where the tires came from. It is the property owner’s responsibility to pay for clean-up and recycling if a) it is determined that the owner bought the property after the tires were dumped or b) the property owner knowingly accepted the tires. If it is determined that the tires were dumped without the owner’s knowledge, grant money is usually

available through the county to clean up the site. The DHEC representative will help the property owner go through the proper steps for cleanup.

- 5) Repair Shops – The owners of repair shops are treated like used tire dealers discussed above.

TRSWA has been a leader in the collection and recycling of waste tires. All counties participate with TRSWA, which owns and operates its own tire processing facility, located adjacent to the regional landfill. TRSWA accepts tires for recycling at no charge from any individual or company who can prove that he paid the \$2 per tire surcharge to a licensed South Carolina tire dealer. TRSWA will accept at no charge any tires, with proper paperwork, from SCDHEC approved Auto Dismantlers. TRSWA and the counties also accept tires from individuals or companies that do not have proper paperwork to prove that all fees were previously paid, for a fee ranging from \$100 per ton to \$150 per ton.

To date, TRSWA has overseen the cleanup and recycling of over 3.5 million tires. TRSWA's processing facility, that began operations in the Spring of 2000, processed over 1,500,000 tires by March 2009. The Authority owns several pieces of processing equipment. There are two products made from these processes: 1) a drain field material suitable for use in the landfill bottom's "protective layer" as part of cell construction; and 2) a tire-derived fuel (TDF) suitable for use in utility boilers. The Authority is analyzing cost versus benefit for these two products. The Authority does not exclude the possibility for producing additional products; however, the relatively inexpensive costs for producing these products presently, coupled with the financial and environmental benefits derived, reinforces the decision to stay the course in this regard.

In order to clean up all "current generation" waste tires in the region, the annual costs, based on a typical market cost of \$.90 per tire for 360,000 passenger tire equivalents (PTEs), would be around \$324,000. (A PTE is defined as the equivalent number of tires at 20 pounds per tire.) Additional costs are incurred by the Authority for special programs in place for processing older waste tires. Such programs include the DHEC Waste Tire Grant program and the Auto Dismantler program. According to the most recent research, no large tire piles that would qualify for these programs exist any longer in the region, but the Authority cleans up an average of 30,000 such tires annually from Auto Dismantlers and numerous, small illegal dumps in the region. Of the 360,000 PTEs generated annually in the Region, approximately 100,000 are handled by private companies without any interface with the Authority's program, leaving the Authority to process approximately 260,000 PTEs annually.

The Three Rivers Board of Directors has taken the position that more money and effort should be directed at enforcement. In that regard, letters to DHEC commissioners, legislators, and other responsible parties support a position for more strict enforcement of litter control and vector control, particularly with respect to illegal tire dumps. It is the position of the TRSWA Board that SCDHEC should take a more proactive role in order to restrict or eliminate the import of waste tires from other states and to restrict or

eliminate the illegal dumping of waste tires on private property. It is also the region's position that DHEC and the counties work to educate the public regarding the rules and guidelines outlined in the Section of this Plan and to enforce the correct application of the rules.

The total monies from government sources going to the counties and TRSWA annually for tire disposal is currently around \$220,000. Additionally, around \$20,000 comes in from private sources. The total amount is calculated as follows: 1) \$30,000 from DHEC waste tire and auto dismantler grants; 2) approximately \$190,000 from the State Treasurer's office, given to the counties who, in turn, pay the Authority; and 3) \$20,000 from private accounts. The Authority receives the added benefit that the recycled tire chips are used as protective/drainage material on the bottom of the landfill. The chips are placed on top of eighteen inches of soil, that is placed on top of a composite geotextile liner, that is placed on top of a high density polyethylene liner, that is placed on top of a composite clay liner of two feet thickness. All of these layers of protection are intended to help the system remove wastewater (leachate) more efficiently and safely from the bottom of the landfill.

The Authority incurs the following costs for siting, construction, and operations of the regional waste tire recycling facility in the region.

<b>ITEM</b>	<b>ANNUAL COST</b>
Collections & Transport	\$40,000
Contractor Costs	\$50,000
Operations & Maintenance	\$115,000
Capital Debt Reduction	\$64,000
General & Administrative	\$10,000
<b>TOTAL EXPENSES</b>	<b>\$279,000</b>

<b>ITEM</b>	<b>ANNUAL REVENUE</b>
Grants	\$30,000
DOR Monies	\$190,000
Tip Fees Collected	\$45,000
Sale of Tire Chips	\$15,000
<b>TOTAL REVENUES</b>	<b>\$280,000</b>

### **7.7.5 Lead-acid Batteries**

Lead-acid batteries are not identified as a major problem in the region. Most retailers encourage the return of old batteries by giving a rebate on new purchases. Those batteries that are not recycled in this manner will be welcome at the recycling centers in the region. The individual counties arrange with a retailer to take back the batteries. Generally, a used passenger car battery can be sold for \$2, which covers the cost of collection and transportation.

Assuming an average battery life of 4 years, 62,366 waste batteries are generated in the region each year from registered vehicles. Additional waste batteries are generated by non-registered vehicles such as off-road equipment, boats, and other sources. Given the current recycling rates, it appears that the majority of waste batteries generated in the region are being recycled and that current collection systems have adequate capacity to recycle the waste batteries generated in the region.

### **7.7.6 White Goods**

“White Goods” is the term used to represent used appliances. The current practice in the region is to allow individuals to bring these materials to collection points, from where the county or the region consolidates into larger piles at separate sites. Once these larger piles accumulate approximately 100 tons of material, the Authority sends its contractor to load and deliver the materials to a recycling facility. At that point, Freon and other gases are removed, and oils and lubricants are removed. The remaining materials are recycled. Revenues associated with white goods sales have been very erratic, reaching all-time highs in 2008 at over \$200 per ton. An average price paid for white goods between 1992 and 2008 is \$30 per ton. The contractor rebates a portion of the sale proceeds to the host county.

### **7.7.7 Yard Wastes and Land Clearing Debris**

All regional Construction and Demolition/Land-Clearing Debris (C&DLCD) landfills accept yard wastes. Yard wastes are defined as leaves, limbs, and other debris normally cleaned up and removed from individual yards. The region’s member counties accept yard wastes at drop-off sites, and most municipalities collect yard wastes from curbside collections. The Authority has no system for collecting or treating yard wastes. Yard wastes are generally buried in Class 1 or Class 2 landfills. The following municipalities compost these materials: Allendale and Aiken

There are currently eighty-one (81) drop off sites operated by the counties in the region. At each site, a separate bin is available for residents to dispose of yard trimmings and land clearing debris. In this way, these materials are directed to the Class 2 landfills rather than having the materials mixed in with MSW. Additionally, at the four (4) MSW Transfer stations, loads containing excessive amounts of yard trimmings and/or land clearing debris are rejected and directed to the Class 2 landfill. In the future, the region



intends to have combustible yards wastes and land clearing debris diverted from landfills and sent to the regional MRF for processing into biomass fuel.

## **7.8 Special Waste Handling**

A “Special Waste” is any waste that requires special handling, including but not limited to pesticide wastes, liquid wastes, sludges, industrial process wastes, waste from pollution control processes, residue or debris from the cleanup or spill of chemical substances, contaminated soil or waste materials, bulky materials, stringy materials, containers, and drums. Prior approval must be obtained for disposal of special wastes, and parameters for determining analyses and handling procedures will be given to the generator prior to approval.

A Special Waste Analysis and Implementation Plan (SWAIP) has been developed for the region. The plan is used at the regional landfill as a blueprint for identifying and handling special wastes. Special wastes are handled on a case-by-case basis for pre-screening so that the operator of a transfer station can accept or reject loads according to the SWAIP. The certified landfill operator is trained to monitor these wastes and handle them according to requirements.

There is at least one company in the region, RSI in Calhoun County, that receives liquid wastes and mixes them with sawdust or other moisture absorbing media, and the mixed material is then hauled to a Subtitle D landfill for disposal. The region approves of the concept of mixing, bulking or otherwise preparing hard-to-handle special wastes to a point where those materials are acceptable in the regional Class 3 landfill when SCDHEC certifies that pre-treatment and permitting are in place.

## **7.9 Bioremediation**

There are no bioremediation facilities in the region. The Authority approves of bioremediation as a viable option for reducing volatile organics and pathogens. At this point, however, there are no cases where the Authority or any member counties have any responsibility for cleanup of contaminated materials.

### **7.9.1 Contaminated Soils**

The Regional Subtitle D landfill accepts contaminated soils with levels of contamination below threshold levels established by regulation. For materials with levels of contamination above this level, generators should contact DHEC for a list of facilities that can treat these materials.

## **7.10 Land Application of Sludge**

There are no known land applications of process or wastewater sludge in the region. The region recognizes land application as a viable treatment and disposal option for sludge and will give due consideration to the proposal of any future facilities for the land application of sludge, when SCDHEC certifies that pre-treatment and permitting are in place.

### **7.11 Hazardous Wastes**

The region assumes no responsibility for disposal of any hazardous wastes. The region recognizes the fact, however, that some household hazardous wastes (HHW) and "small quantity generator" wastes will inevitably enter the MSW stream. The operators of transfer stations and other repository areas will be trained to recognize hazardous wastes, from large and small quantity generators, and these wastes will be segregated from the rest of the MSW stream. Effort will be made to identify the generators, and subsequent liability and responsibility will be passed on to the generator in the way of fines and/or pass-through expenses.

### **7.12 Household Hazardous Waste**

As noted in the South Carolina Solid Waste Management Plan, "No records of quantity and composition of [household] hazardous wastes have been kept." According to the U.S. EPA (*Decision-Makers Guide to Solid Waste Management*, November 1989, page 117) "household hazardous waste makes up only a very small percentage (less than one percent) of the municipal solid waste stream..." Based on EPA figures, the region generates less than 3,162 tons of HHW per year. Currently, this HHW is collected and disposed with the MSW through the regions' municipal and county collection and disposal systems. HHW is, by federal and state law, permissible waste for disposal in MSW landfills. The region recognizes the fact that some household hazardous wastes (HHW) and "small quantity generator" wastes will inevitably end up in the regional landfill. In fact, this assumption is the primary reason for the EPA's strict siting, construction, and operational criteria associated with subtitle D landfills.

Counties are encouraged to sponsor "Household Hazardous Waste Collection Day(s)." At these special events, the county should contract with a firm that specializes in removal of household hazardous wastes, such as solvents, aerosols, fluorescent tubes, and oil based paint. The county should give advance notice to residents so that they know the types of materials and quantities that will be accepted. Working with the contractor to understand any special handling considerations, the county should inform the public as to the acceptable condition of materials to be collected. The county, the contractor, and private citizens should understand and adhere to all applicable regulations, including OSHA and other safety regulations or standards. The county must have in place Emergency Response procedures and/or Contingency Plans. It is also required that there be a Closure plan for collection/storage site(s)

The EPA website has general information on household hazardous waste collection. Also, the Carolina Recycling Association's HHW Council published a Technical Resource Guide that has a great deal of background information

### **7.13 Litter Control**

An increase in litter is one of the inevitable consequences brought about by changes in methods of solid waste management. As people incur added expenses involved with modern waste handling, there will be a growing number of abuses of the system. Several counties in South Carolina have litter control officers, with the normal fine of over \$200 per offense. It is

critical that a program such as this be in place in every county once disposal becomes less convenient for waste generators. With a loss of convenience, there will be an increase in litter, and experience shows that enforcement of litter laws is imperative in order to ensure proper disposal. Increases in fines for litter are included in the Solid Waste Policy and Management Act.

The governments of the region have constructed drop off sites that are available to all citizens living in the region, whether residing in incorporated or unincorporated areas. The drop off sites are not intended to be the sole method of collection and disposal for individuals, but are merely intended to serve as a convenience; hence the term “Convenience Center” is often used to describe these sites. The governments of the region prefer and encourage private citizens to contract with private haulers for curbside or streetside collection of MSW. Streetside or curbside pickup helps curb litter.

Roadside litter has increased over the last ten years. A major cause for this has been the increased transportation distances incurred by individuals in order to get their household MSW to a Drop-Off site. Much of this household MSW is transported in pickup trucks that are not properly tarped so as to contain the materials. It is widely believed by magistrates and law enforcement officials that tarps are not necessary except on commercial vehicles. Additionally, there is widespread belief that litter fines can only be enforced when the act of littering is witnessed by a law enforcement official.

The region needs to encourage a legislative mandate for tarping of all vehicles that carry MSW, whether they carry it for commercial gain or not. Additionally, the state’s political leaders need to work with magistrates to require uniform enforcement of litter offenses.

Many citizens are reluctant to accept change. It has been learned that if the convenience of green box sites is taken away too quickly, many people will simply discard their trash along a roadside or in a wooded area. The only way to combat this reality is to have a large and effective litter control force, such as using Sheriff’s Deputies. Counties are all encouraged to have litter control officers to more effectively police litter. The region intends to work diligently with magistrates to enforce litter laws and ordinances.

The Authority and the counties are currently implementing plans, in cooperation with Palmetto Pride of South Carolina, to put placards on each waste collection vehicle. These placards will have a toll-free telephone number, and each placard will carry a separate truck number so that citizens can call in and report any litter violation caused by one of the county or Authority-own trucks.

The counties sponsor litter pick-up crews as ongoing part of their operations. Three Rivers Authority polices a stretch of highway three miles on either side of the regional landfill. The Authority hires crews each week to pick up litter along that six-mile stretch of highway.



## **8.0 PUBLIC RELATIONS, TECHNOLOGY, & GOAL SETTING**

TRSWA and its member counties will implement the region's solid waste management program, educate the public on waste issues, and work with other county and municipal officials as needed to address specific problems. Efforts will include:

1. Working in conjunction with municipalities, TRSWA, Clemson University Extension Service, Trade groups, Palmetto Pride, and Keep America Beautiful to educate the public, industry and media on solid waste issues.
2. Working in conjunction with city police and county sheriffs, the wildlife service, United States Corps of Engineers, and others to educate the public and enforce litter and management policies.
3. Attending public hearings and meetings with DHEC and EPA as needed.
4. Retaining and utilizing professional staff as needed to address technically environmental and economic issues.
5. Retaining and utilizing the services of private consulting and engineering firms as needed to address technically environmental and economic issues.
6. Reporting to the various county councils on any problems related to private waste disposal and treatment facilities.
7. Working with SCDHEC on a local and state-wide level in order to stay abreast of regulatory issues, actively providing input when appropriate.
8. Working with the lawmakers on local and state-wide level in order to stay abreast of legislative issues, actively providing input when appropriate.
9. Working with the United States Department of Energy (DOE) and the Savannah River National Laboratory (SRNL) in areas of technology transfer as they may apply to solid waste treatment and disposal.
10. Through the TRSWTC, work with allied organizations, including SWANA.
11. It is the region's goal to divert approximately fifty percent (50%) of the region's landfilled MSW to recycling, composting, or waste transformation facilities.

These activities will be funded by charges for collections within the county, administrative charges added to TRSWA contracts, and grants from SCDHEC, the Governor's office, and others as available. TRSWA personnel, working with county personnel will distribute flyers, ads, and educational literature in the schools, churches and civic groups.

TRSWA also intends to utilize The Office of Solid Waste Reduction and Recycling, SCDHEC, for portable displays, slide presentations, speakers, children's materials and other educational items. Included among these educational items are brochures such as: "Starting at Home", "Give Oil for Energy Recovery", "Starting a Recycling Program", and "Recycling Yard Wastes: Home Composting".

TRSWA and the counties will work with the SCDHEC Center for Waste Minimization to reduce and reuse industrial wastes.

The member counties of TRSWA intend to meet or exceed all reduction and recycling goals. In order to do so, reduction efforts are to be carried out primarily on the local level, using support resources listed above. Local recycling programs are supported, but major recycling efforts are to be carried out on a regional level.

### **8.1 Allowance For Technology Development**

Consistent with the Business Agreement signed with the Department of Energy, TRSWA deposits \$1 into a special account for each ton of MSW received at the regional landfill. The purpose of this account is to support development and demonstration of new technologies and systems that will improve the environmental and economic considerations for MSW disposal. It has been stated that the long term goal of the TRSWTC is to develop technologies and systems that will enable the regional landfill to last forever. TRSWA has now established the Three Rivers Solid Waste Technology Center (TRSWTC), a non-profit organization formed to make determinations as to the direction and focus for technology development. The TRSWTC has a fourteen member Board of Directors and qualifies as an eleemosynary, 501(c)3 organization.

The TRSWTC accepts donations, investments, and partnerships with other individuals and organizations. Projects are selected through a solicitation and evaluation process. Solicitations are made public through the use of newspapers and trade journals. Review and evaluation of proposals is made by staff and peer review groups, with the help of the Applied Research Foundation of the Solid Waste Association of North America (SWANA).

The Bylaws for TRSWTC read:

*The Center was formed to address regional and national solid waste issues through research, demonstration and development of recovery and recycling methods. Through addressing these issues, the Center should assist and lessen the burden of the Authority, the Authority's nine member counties and the U.S. Department of Energy Savannah River in their efforts to serve the area in disposing of solid waste.*

The Mission Statement of the TRSWTC is:

*The Three Rivers Solid Waste Technology Center will be a national resource in the development, demonstration, and commercialization of solid waste technologies, provide technology transfer and regional economic development, promote education and training, and extend the life of the Three Rivers Authority Regional Landfill.*

TRSWA and its member counties support the TRSWTC, and it is the policy of the region that new technologies and systems developed in conjunction with the TRSWTC will be given first priority for implementation by TRSWA and its member counties.





## 9.0 FULL COST DISCLOSURE & FINANCIAL CONSIDERATIONS

Annual costs of Governmental services for the regional system follows. Dollar amounts are rounded.

### 9.1 Costs - Landfills

Subtitle D landfill	6,500,000
Class 2 landfills (2 @ \$ 400K )	800,000
Class 2 landfills (4 @ \$ 100K )	400,000

### 9.2 Costs - Collections

Drop-off sites (81 @ \$ 50K)	4,050,000
Transfer Stations (5 @ \$400K)	2,000,000

### 9.3 Costs - Processing Facilities

MRFs (2)	\$1,000,000
RMBOs (4 @ \$200K)	800,000
Tire Processing Facility (1 @ \$200K)	200,000

### 9.4 Transportation Costs

Drop-off sites (81 @ \$ 30K)	2,430,000
Transfer Stations (1 @ \$800K)	700,000
Transfer Stations (1 @ \$300K)	300,000
Transfer Stations (2 @ \$100K)	200,000
Over-the-road	1,500,000

Total Operations	\$20,970,000
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Revenues	\$ 5,573,112
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Net costs	\$15,394,888
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Costs per person (360,439)	\$ 42.71
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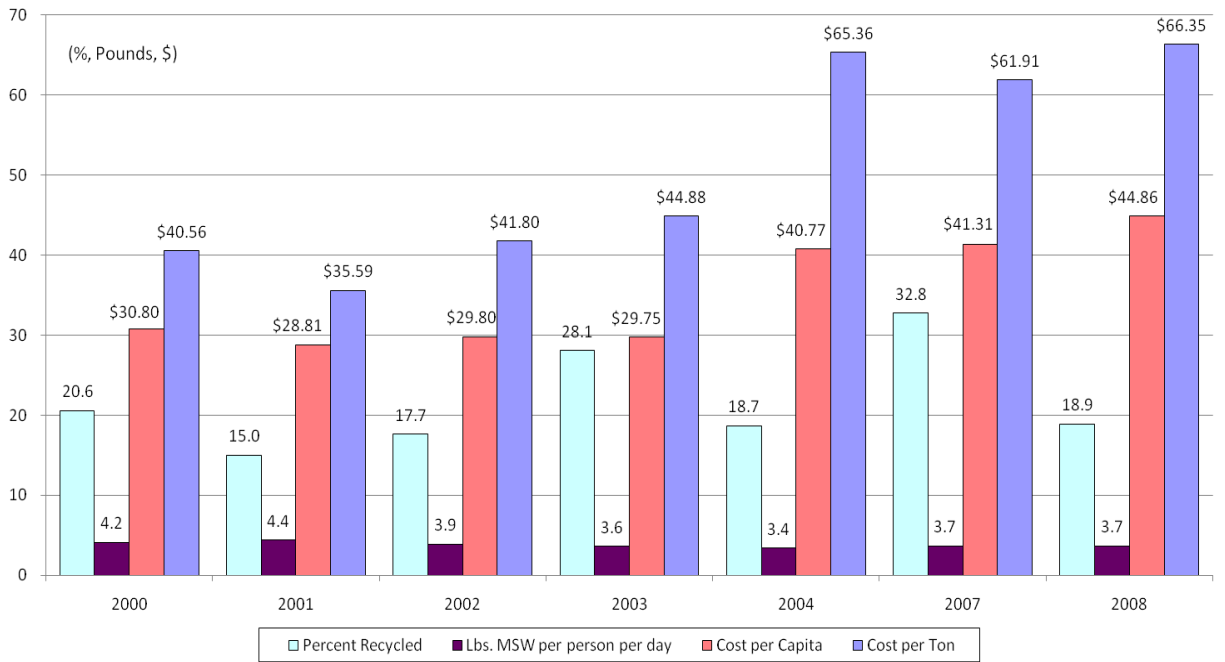
Costs per ton (248,662)	\$ 61.91
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## 9.5 Conclusions

The graphs that follow support the conclusion that the counties have done an excellent job at balancing numerous management objectives including legal, political, financial, environmental, and regulatory considerations. Over the last five years, they have delivered solid waste management services at an average rate of \$14.78 per person per year less than the average for the state. That amounts to a savings to the taxpayers in this region of \$ 5.33 million per year ( $14.78 \times 360,439$ ). Because TRSWA is the only multi-county solid waste Authority in the state, it is logical to conclude that the savings are made possible by the economies of scale brought about through regionalization. Over the last five years, the counties in the region covered by this Plan have generated a per capita waste volume that is twelve percent (12%) less than the average for the state. More than half of the financial savings (roughly \$8 per person per year) can be attributed to the reduction of MSW generation, addressing the first priority on the EPA Waste Hierarchy (Reduce).

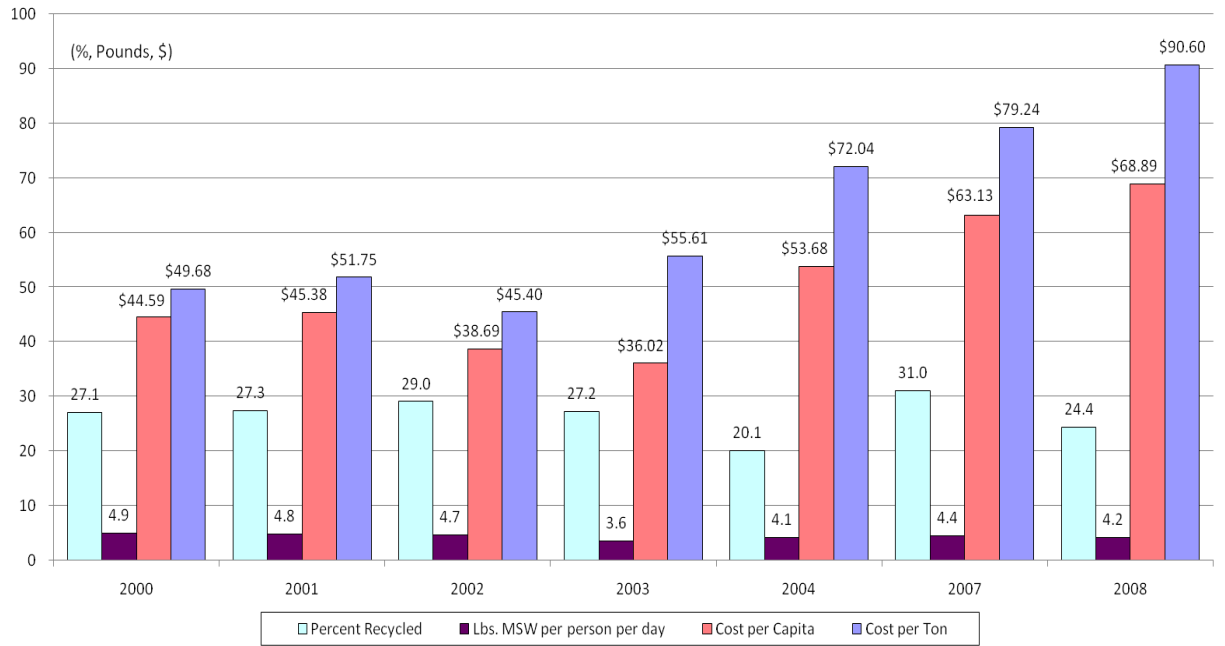
The region encourages DHEC to discontinue the practice of requiring counties to report annual “Full Costs” on a “cost per ton” basis. The current practice that requires that counties publish their “cost per ton” in a local newspaper should be discontinued. The counties should only be required to publish their “cost per capita.” By evaluating cost per ton, the public is easily misled. The intent of the Solid Waste Policy and Management Act, as well as the waste management hierarchy, is skewed. A community that has a high diversion rate may find that the cost per ton is higher as a result, while the costs per capita, and the overall (total) costs, are lower due to reduction and recycling efforts. The counties of TRSWA are proud to report the lowest generation rates per capita in the state, and the relatively low cost per capita is due in large part to the low generation rate. Most likely, the additional cost savings are a result of economies of scale and good management.

**Regional Solid Waste Trends  
Graph 9-1**

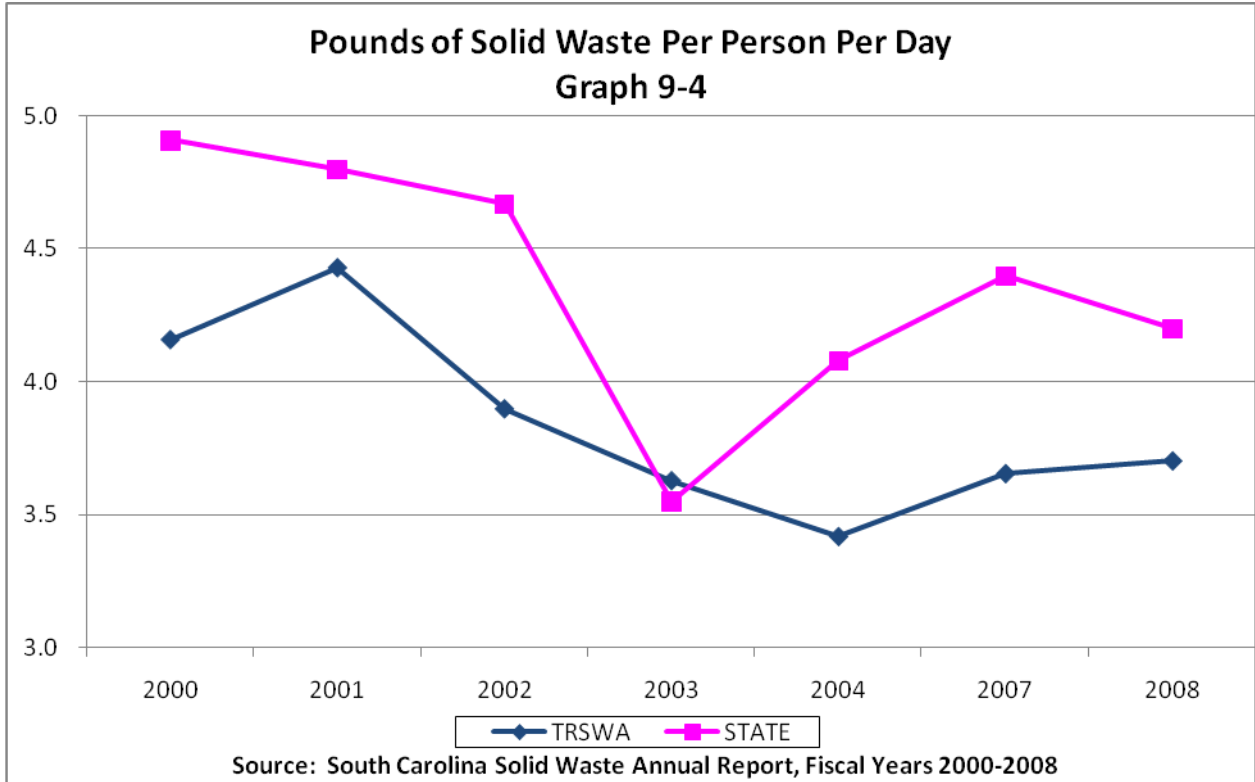
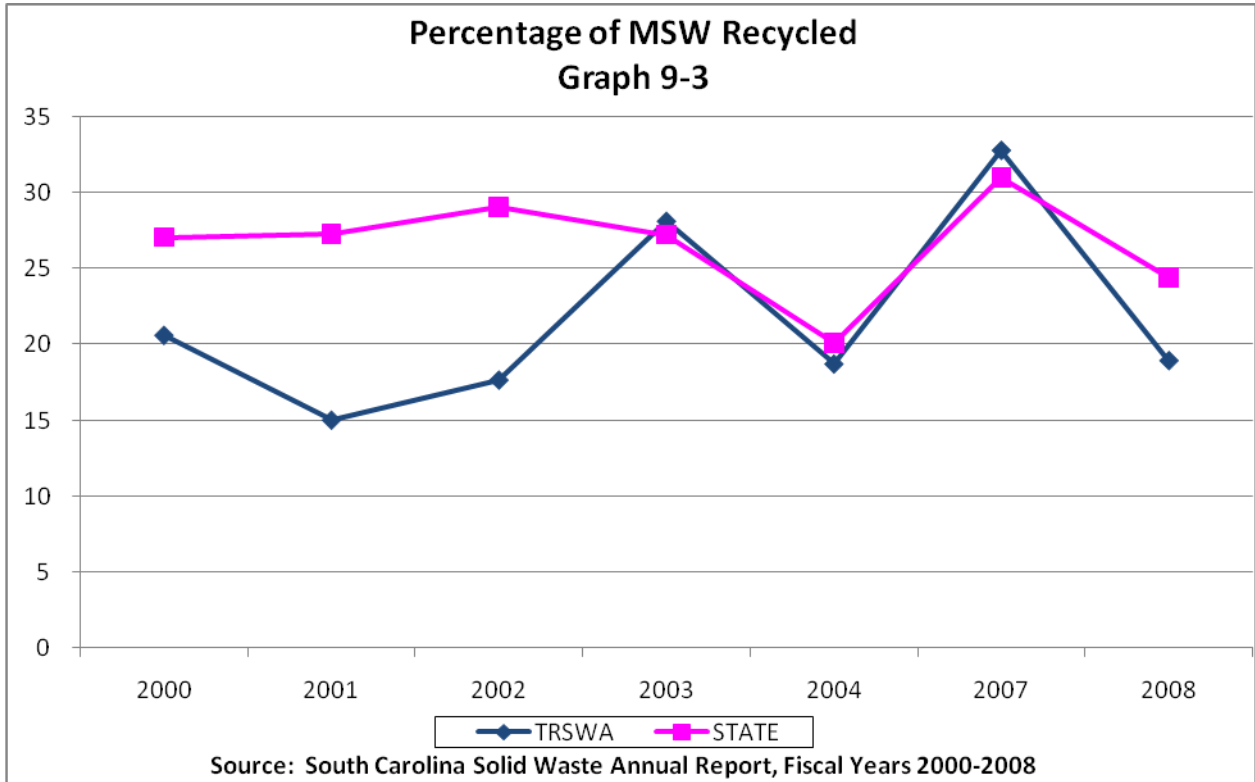


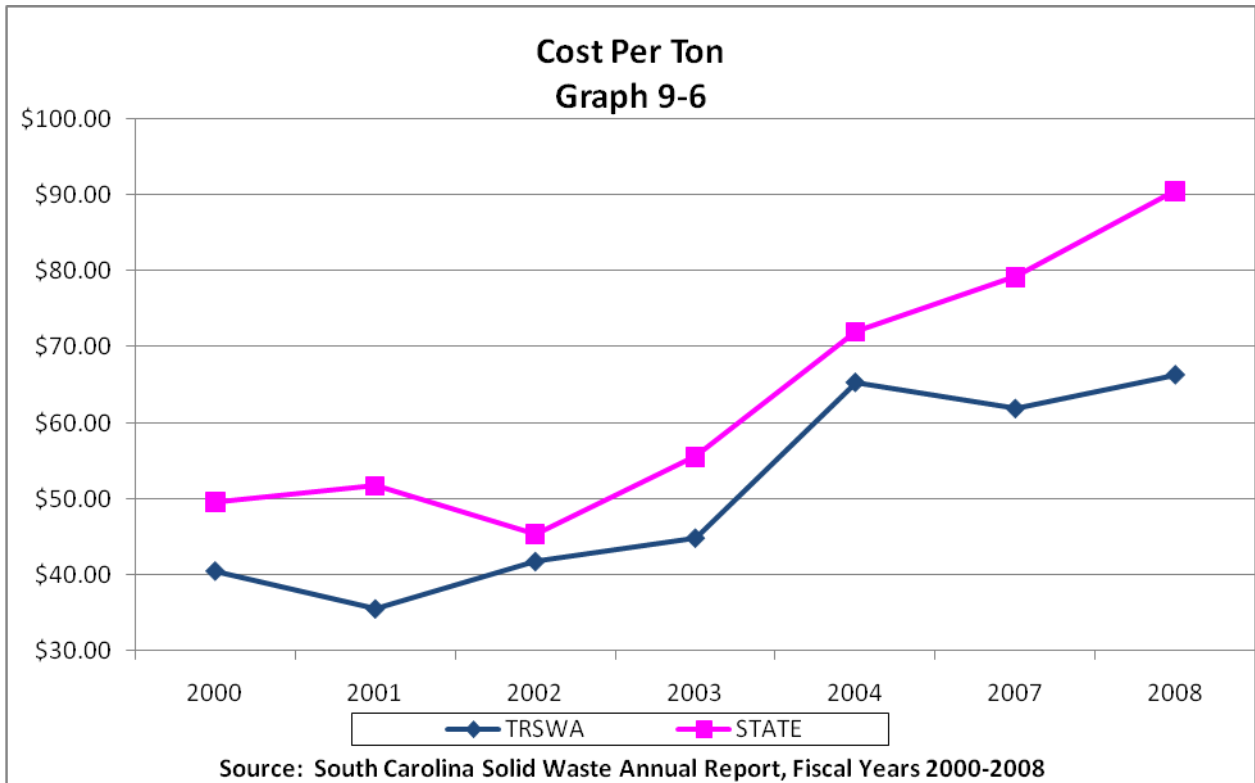
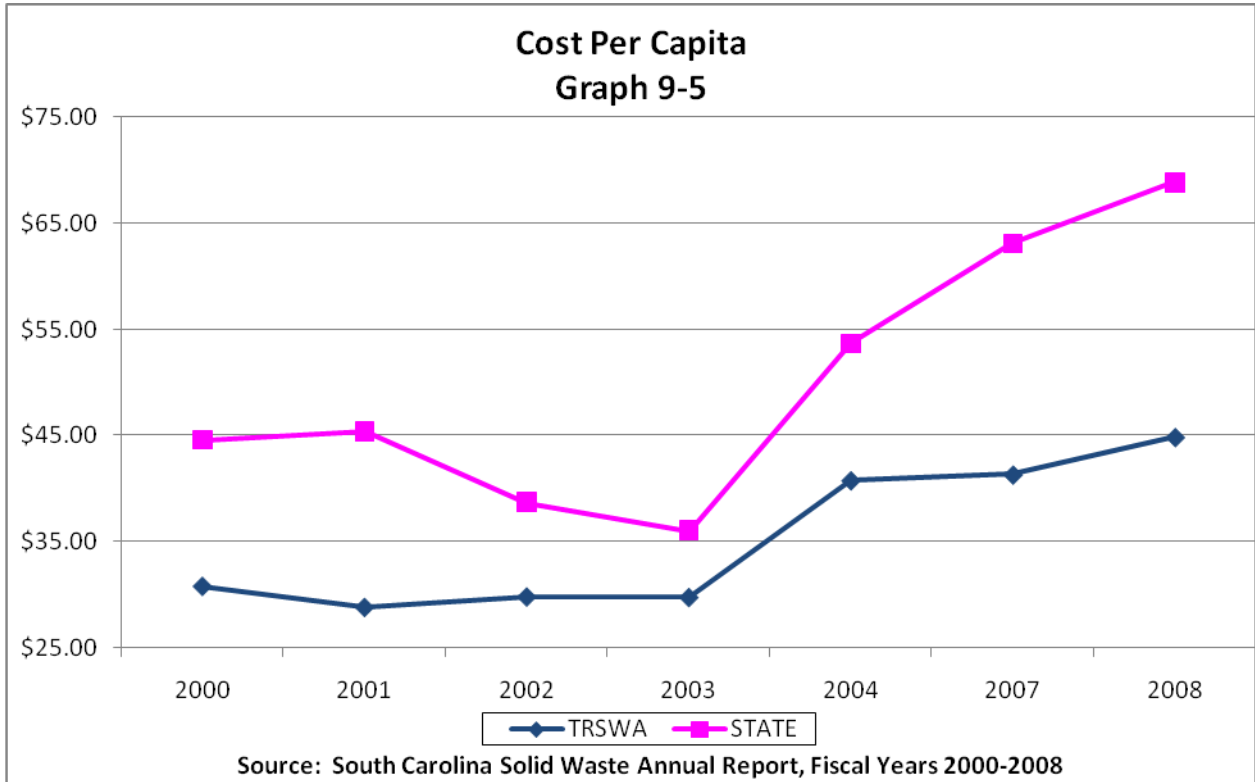
Source: South Carolina Solid Waste Annual Report, Fiscal Years 2000-2008

**State Solid Waste Trends**  
**Graph 9-2**



Source: South Carolina Solid Waste Annual Report, Fiscal Years 2000-2008





## **10.0 PUBLIC PARTICIPATION, CONSISTENCY, & PLAN REVISION**

Each member county has one representative on the TRSWA Board of Directors, and that representative serves at the pleasure of the individual county council. The County Administrators serve on a Technical Advisory Committee (TAC). Additionally, regional public works/solid waste managers meet periodically with TRSWA staff. Consistent with the SCSWPMA, the region maintains an active Solid Waste Advisory Committee (SWAC).

Each member county has passed appropriate resolutions giving regional planning responsibility to the Authority, subject to approval by the individual counties. Any changes, modifications, amendments, or revisions to this Plan will be made by the Three Rivers Solid Waste Authority Board of Directors, with approval from the member counties.

This "Solid Waste Management Plan" is dated August 1 2009. It has been reviewed by the elected officials of each County Council, the Regional Solid Waste Advisory Committee (SWAC), the TRSWA Technical Advisory Committee (TAC), and the regional Public Works/Solid Waste managers. It has been reviewed and adopted by the TRSWA Board of Directors and each individual county covered in the Plan. The counties have communicated with the municipalities within their boundaries to ensure that all programs are consistent and coordinated. All municipalities were canvassed for input, and all pertinent information received from the municipalities was included in the Plan. Three Rivers staff also meets with municipal representatives from time to time for coordination and to receive input for regional waste management activities.

The Authority is responsible for writing and maintaining an up-to-date Regional Solid Waste Management Plan, with future approvals following the same procedures as outlined in the paragraphs above. The TRSWA Board will appoint members of the Solid Waste Advisory Committee (SWAC) from time to time as needed. The SWAC must include three representatives of municipalities, three representatives of the recycling and processing industry, and three at-large representatives representing counties. Plan revisions, modifications, amendments, and changes must be approved in the same manner as outlined above for the Regional Plan. Such changes may be enacted at any time.

All county council meetings and meetings of the TRSWA Board of Directors are publicized. Various members of the public, including the press, are frequently in attendance at the meetings. Decisions are made in a public forum in accordance with state and local policies.

The Authority and the counties will consider new programs and/or facilities offered by private entities when deemed to be consistent with this Regional Plan. Any facilities or systems contemplated by private entities should be discussed with TRSWA and the affected counties, who will respect the confidential nature of subjects discussed to the extent allowed by law.

The member counties and TRSWA will follow procedures outlined by the South Carolina

Department of Health and Environmental Control (SCDHEC) for determining “need” and “consistency.” SCDHEC will determine “need” according to regulatory requirements that specify the maximum number of facilities that can be located within a certain geographical proximity to one another and according to the state and regional plans. SCDHEC’s determinations will be mailed to the Authority’s General Manager, in writing, with a copy mailed to the Chairman of the Board of Directors and a copy mailed to the County Administrator in the county in which the facility is proposed. Three Rivers Solid Waste Authority will have fifteen (15) days after receipt of SCDHEC preliminary determination to respond in writing to SCDHEC. If TRSWA determines that a proposed facility is inconsistent with its Plan, TRSWA must document the reasons for disagreement with the DHEC determination, in writing, to SCDHEC, and the reasons must be based on the Regional Plan or local ordinances. TRSWA will make its decisions based on the content of this Regional Solid Waste Management Plan, ongoing changes in laws and regulations, as well as local ordinances.

Prior to the Consistency determination, the applicant must demonstrate the “need” for the proposed facility according to Regulation 61-107.17. The term “Need,” as it relates to this regulation, is not an endorsement from SCDHEC as to actual need, which is determined by local governments and supported by the written Solid Waste Management Plan in effect for the local governments at the time. A “demonstration of need” pursuant to this regulation is tantamount to a determination that the facility would be appropriate from a regulatory perspective based on a number of criteria including spatial and volumetric calculations relative to similar facilities, subject to consistency determination. The proposed facility or expansion must also be consistent with the state solid waste management plan.

Any new or existing solid waste management facility must comply with local standards including but not limited to zoning, land use, and other local ordinances. TRSWA will amend its Solid Waste Management Plan to include a new or expanded facility only after a permit has been issued.

TRSWA has the authority to revoke its endorsement of a “Letter of Consistency” if the permit application contains a material misrepresentation of fact, is inaccurate, or is not representative of the request for the “Letter of Consistency”.

## **10.1 Assumptions**

The TRSWA Solid Waste Plan was prepared based on the following assumptions:

- The governments of Aiken, Allendale, Bamberg, Barnwell, Calhoun, Edgefield, McCormick, Orangeburg, and Saluda Counties will work cooperatively toward implementing the plan in the best interest of all residents in the region.
- County governments work with the municipalities and private companies within their boundaries to ensure consistency and coordination of services.
- County governments work with private citizens and companies to ensure consistency and



coordination of services.

- Local governments will work with TRSWA, private individuals, and private companies when appropriate to develop programs best suited for implementation of the plan.
- A strong planning program will continue, and a concentrated effort will be made by the Authority so as to encourage member counties and municipalities to implement the plan.
- Landfilling will continue to be a primary method of solid waste disposal. Changes in technology will continue to be carefully monitored, however, and could alter the region's reliance on landfilling.
- The region will continue to look to DOE and WSRC to find areas for mutual benefit. TRSWTC will work with scientists, engineers, and professionals in areas of technology development applicable to solid waste management.
- The region's recycling system is based on the following assumptions: 1) that any meaningful reduction and recycling plans must be simple enough to be implemented by a large percentage of MSW generators, thereby creating an economy of scale; 2) that source separation and diversion of select materials is the most effective recycling/diversion method; 3) that industry holds the most promise for cost-effective recycling/diversion of the greatest volumes of materials; and 4) that processing at MRFs or Recovered Materials Baling Operations (RMBOs) must allow for some commingling (contamination) of dissimilar materials as a natural consequence of typical solid waste collection and disposal systems; 5) that this commingling of materials allows for a less costly recovery of a greater quantity of the overall wastestream; and 6) that there is flexibility built into the system so that improvements can be implemented as technology improves.
- All facilities or systems in this region, public or private, will be consistent with this Plan.
- That the member counties will make annual progress reports to SCDHEC, and information from these and other reports will be used as the basis for data evaluation and planning.

## **10.2 Exceptions and Challenges to the Regional Plan**

If any provisions of this Regional Plan are inconsistent with provisions of general, special, or local laws, or if any provisions of this Regional Plan are held to be invalid or unconstitutional in a court of law, the other provisions of this Regional Plan are nevertheless deemed to be in full force and effect.



## 11.0 REGIONAL SOLID WASTE MANAGEMENT FACILITIES

### 11.1 Aiken County

South Carolina DHEC reported the following information on facilities in Aiken County.

#### REGIONAL SOLID WASTE MANAGEMENT FACILITIES

Table 11-1

<b>Facility Permit #</b>	<b>Owner/Operator</b>	<b>Tonnage Per Year</b>	<b>Facility Type</b>	<b>Remaining Life</b>
022431-1601	Corning	15,000	Class 2 IWP	100 years
023336-1601	SE Clay	6,880	Class 2 IWP	35 years
022481-1201	GL Williams		Class 2	Unknown
022481-1701	GL Williams		Class 1 LCD	Unknown
022725-1701	Gary Miller		Class 1 LCD	Unknown
022719-1701	Jack Wood		Class 1 LCD	Unknown
022743-1701	John Swearingen		Class 1 LCD	Unknown
022720-1701	Randy Hill		Class 1 LCD	Unknown
022740-1701	Mike Williams		Class 1 LCD	Unknown
021001-1201	Aiken County	75,000	Class 2	20 years
021001-1202	Aiken County	1,000	Class 2	20 years
022737-1201	Rainbow Falls		Class 2	Unknown
023320-1601	SCE&G Urquhart		Class 2	Unknown
022676-3001	APAC (GL Williams)		Composting	Unknown
022676-3002	421 Composting (GL Williams)		Composting	Unknown
021002-3001	City of Aiken		Composting	Unknown
065800-1901	SRS/SRNS	120,000	Class 2	19 years
025500-1601	SRS/SRNS	2,500	Class 2 Ash	50 years
025800-1602	SRS/SRNS	25,500	Class 2 Ash	8 years
025800-1603	SRS/SRNS	35,874	Class 3 IWP	21 years
023308-1601	WR Grace		IWP	Unknown
022761-3001	Carolina Country Construction		Wood grinding	Unknown
021003-2001	North Augusta		MRF	
024202-1101	Three Rivers	250,000	Class 3	100 years
024202-2001	Three Rivers		MRF	

Aiken County also reported the following information on government-owned and operated facilities in Aiken County.

**Aiken County 021001-1201 (Barden Mine)**

The Barden Mine Class 2 Landfill began operation in May 1993 with a life expectancy of 31 years. This site receives approximately 50,000 tons per year. This disposal rate is expected to remain constant less diversions from any future composting activities.

**Aiken County 021001-1202 (Wagener)**

Aiken County received a permit for a C&D section at the Wagner MSW Landfill in May 1993. After regulations changed in 2008, the county changed the landfill’s status to a Class 2 landfill. Estimated capacity is in excess of fifty (50) years at current disposal rates of approximately 1,000 tons per year. This disposal rate should remain constant less diversions from any future composting activities. This permit also covers one disposal trench for asbestos. It is estimated that this trench will continue to accept asbestos for approximately 25 years. Based on fiscal year 1993, asbestos disposal is approximately 165 tons per year.

**City of North Augusta MRF, 101 Clay Pit Road, North Augusta, SC**

The Materials Recovery Facility has a design throughput capacity to handle 100-120 tons per day of “blue-bagged” commingled recyclables co-collected with MSW. The facility is handling the city of North Augusta’s co-collected recyclables. Recycling diversion rates for the municipality is approximately 15%. Currently, the facility is producing 350 tons per month of recyclables.

**City of Aiken Composting Facility, located on the 188 Bypass between Camellia Street and Richland Avenue**

The facility composts yard trash only and has a capacity of 150,000 CY. Currently, the facility is handling approximately 70,000 CY of yard trash materials per year.

**11.2 Allendale County**

South Carolina DHEC reported the following information on facilities in Allendale County.

REGIONAL SOLID WASTE MANAGEMENT FACILITIES

Table 11-2

<b>Facility Permit #</b>	<b>Owner/Operator</b>	<b>Tonnage/Year</b>	<b>Facility Type</b>	<b>Remaining Life</b>
031001-3001	Town of Allendale		composting	
LF2-00004	YouAll, LLC	21,000	Class 2 LF	25 years

### 11.3 Bamberg County

#### REGIONAL SOLID WASTE MANAGEMENT FACILITIES

Table 11-3

<b>Facility Permit #</b>	<b>Owner/Operator</b>	<b>Tonnage/Year</b>	<b>Facility Type</b>	<b>Remaining Life</b>
051001-1201	Bamberg County	13,000	Class 2	50 years
051001-6001	Bamberg County	30,000	MSW Transfer	

Bamberg County also reported the following information on government-owned and operated facilities in Bamberg County.

#### Bamberg County Transfer Station

Bamberg County has a permit for a 250 TPD Transfer station located at the Bamberg County Landfill. The Transfer station will serve the entire county.

#### Bamberg County Class 2 Landfill 051001-1201

Estimated capacity is in excess of fifty (50) years at current disposal rates of approximately 10,000 tons per year. This disposal rate should remain constant less diversions from any future composting activities.

### 11.4 Barnwell County

#### REGIONAL SOLID WASTE MANAGEMENT FACILITIES

Table 11-4

<b>Facility Permit #</b>	<b>Owner/Operator</b>	<b>Tonnage/Year</b>	<b>Facility Type</b>	<b>Remaining Life</b>
061001-1201	Barnwell County	25,000	MSW-Transfer	
061001-6001	Barnwell County	6,000	Class 2	25 years

Barnwell County also reported the following information on government-owned and operated facilities in Barnwell County.

#### Barnwell County C&D Landfill 061001-1201

Barnwell County operates a Class 2 Landfill. Permitted capacity is 6,000 tons per year. Design capacity is 782,000 CY with a life expectancy of 25 years.

## **11.5 Calhoun County**

### REGIONAL SOLID WASTE MANAGEMENT FACILITIES

Table 11-5

<b>Facility Permit #</b>	<b>Owner/Operator</b>	<b>Tonnage/Year</b>	<b>Facility Type</b>	<b>Remaining Life</b>
093322-1901	Carolina Eastman		Class 2	
091001-1201	Calhoun County		Class 2	
092622-2001	Regulatory Solutions	10,000	SW Processor	
092432-1601	Carolina Eastman	75,000	IWP	20 years

Calhoun County also reported the following information on facilities in Calhoun County.

#### **Carolina Eastman IWP-092432-1601**

Disposes of fly ash. Remaining capacity is 17-20 years or 65,000 - 77,000 tons. Current disposal is 3,850 tons per year. This disposal rate is expected to remain constant over the life of the facility.

## **11.6 Edgefield County**

### REGIONAL SOLID WASTE MANAGEMENT FACILITIES

Table 11-6

<b>Facility Permit #</b>	<b>Owner/Operator</b>	<b>Tonnage/Year</b>	<b>Facility Type</b>	<b>Remaining Life</b>
192697-1701	Pioneer		Class 1	
192653-5201	Ridge Recyclers		Tire Processing	
192757-1701	Eugene Easler		Class 1	
194200-1201	Tri-County	7,000	C&D-IV	
194200-6001	Tri-County		MSW Transfer	

Edgefield County also reported the following information on government-owned and operated facilities in Edgefield County.

#### **Tri-County C&D Landfill 194200-1201**

Current disposal is 4,000 TPY. The Tri-County C&D Landfill serves Edgefield, McCormick, and Saluda Counties. Tri-County is in the process of closing this landfill.

### **11.7 McCormick County**

#### REGIONAL SOLID WASTE MANAGEMENT FACILITIES

Table 11-7

<b>Facility Permit #</b>	<b>Owner/Operator</b>	<b>Tonnage/Year</b>	<b>Facility Type</b>	<b>Remaining Life</b>
331002-1701	Town of McCormick	1,000	Class 1	10 years

McCormick County also reported the following information on government-owned and operated facilities in McCormick County.

#### **Town of McCormick 331002-1701**

The town of McCormick's landfill receives yard Trash only. It is not open to the public and has not received materials since 2002. Current life expectancy is 10 years.

### **11.8 Orangeburg County**

#### REGIONAL SOLID WASTE MANAGEMENT FACILITIES

Table 11-8

<b>Facility Permit #</b>	<b>Owner/Operator</b>	<b>Tonnage/Year</b>	<b>Facility Type</b>	<b>Remaining Life</b>
382480-1701	Stillinger/Spires		Class 1	
381002-1201	Orangeburg City		Class 2	
381001-1201	Orangeburg Co.	20,000	Class 2	10 years
383345-1601	Albemarle Corporation		IWP	
383304-1601	Georgia Pacific		IWP	
382633-8001	Council Energy		Land application	
383320-1601	SCE&G Cope		Class 2	
383320-8001	James Traywick		Land application	
381001-6001	Orangeburg Co.		MSW Transfer	

Orangeburg County also reported the following information on facilities in Orangeburg County.

#### **Orangeburg County 381001-1201**

Permitted capacity is 30,000 CY/YR. Current disposal rate is 20,000 tons per year. Orangeburg County has upgraded the permit to a Class 2 landfill under new regulations.

**Orangeburg County Transfer Station 381001-6001**

Orangeburg County has a permit for a 300 TPD Transfer station to serve Orangeburg and Calhoun Counties.

**City of Orangeburg 381001-1201**

Remaining life is 2 years, 3 years if they go vertical. Current disposal is 3,860 tons per year, that will remain constant over the life of the facility. Future plans will coordinate with the regional effort.

**Albemarle Corporation (formerly Ethyl Corporation) IWP- 383345-1601**

The total capacity of the on-site landfill is 700,000 CY with a remaining capacity of 262,000 CY. The current rate of disposal is 26,781 CY per year, and is expected to remain constant over the ten (10) years remaining life of the facility.

**Georgia Pacific 383304-1601**

Original capacity of landfill was 25 years, but this has been extended to 50 years due to source reduction. Current disposal is 6,325 tons per year. By 2000, disposal will be less than 3,000 tons per year and will either remain constant or reduce over the remaining life of the facility. Georgia Pacific will apply to convert to an IWP landfill once the IWP regulations are finalized.

**11.9 Saluda County**

REGIONAL SOLID WASTE MANAGEMENT FACILITIES

Table 11-9

<b>Facility Permit #</b>	<b>Owner/Operator</b>	<b>Tonnage/Year</b>	<b>Facility Type</b>	<b>Remaining Life</b>
412682-1701	Bobby Goff		Class 1	
412785-3001	SH Wood		Wood grinding	
303747-8001	Norbord Ash		Land Application	



## **11.10 Facility Contacts**

Aiken County  
828 Richland Avenue, West  
Aiken, SC 29801  
803/642-1532

Allendale County  
PO Box 190  
Allendale, SC 29810  
803/584-3438

Town of Allendale  
PO Box 551  
Allendale, SC 29810  
803/584-4619

Bamberg County  
PO Box 146  
Bamberg, SC 29002  
803/245-5191

Barnwell County  
Barnwell County Courthouse  
Barnwell, SC 29812  
803/541-1000

Calhoun County  
Courthouse Annex, Suite 108  
St. Matthews, SC 29135  
803/874-2435

Council Energy, Inc.  
PO Drawer 347  
Orangeburg, SC 29116  
803/534-4360

Eastman Chemical Company, Carolina  
Eastman Division  
PO Box 1782  
Columbia, SC 29202  
803/794-9200  
Location: US Highway 21 and 176, Columbia, SC

**Facility Contacts (cont'd)**

Ethyl Corporation/Albemarle Chemical  
PO Box 1028  
Orangeburg, SC 29115  
803/534-5781

Edgefield County  
Tri-County SW Authority  
Edgefield County  
124 Courthouse Square  
Edgefield, SC 29824  
803/637-4000

Georgia Pacific Corporation  
PO Box 1190  
Holly Hill, SC 29059  
803/496-5022

Global Investment Recovery  
Jim Glenn  
5244 Festival Trail  
Salley, SC  
803-933-0319  
803-258-1620

Town of McCormick  
117 West Augusta Street  
PO Box 306  
McCormick, SC 29835  
864/465-2476

North Augusta Regional MRF  
PO Box 6400  
N. Augusta, SC 29841  
803/441-4224

Orangeburg County  
PO Box 9000  
Orangeburg, SC 29116-9000  
803/533-6100

Owens-Corning Fiberglass  
PO Box 499  
Aiken, SC 29801

**Facility Contacts (cont'd)**

Ridge Recyclers  
490 Highway 121  
Johnston, SC 29832  
803/637-6646  
Facility Address: Same

Savannah River Nuclear Solutions, LLC  
6140 Woodside Executive Court  
Aiken, S.C. 29803  
803/557-9420

SCE&G Cope Landfill  
1426 Main Street  
Columbia, SC 29201  
803/748-3105

SCE&G Urquhart Station Landfill  
Mail Code 175  
Columbia, SC 29218  
803/748-3597

Southeastern Clay Company  
PO Box 1055  
Aiken, SC 29801  
803/648-3248

Ms. Joyce Spires  
Spires/Stillinger Landfill  
2006 Cannon Bridge Road  
Cordova, SC 29039

Three Rivers Solid Waste Authority  
227 Gateway Drive, Ste 213  
Aiken, SC 29803  
803/652-2225

G. L. Williams Landscaping, Inc.  
501 Rainbow Falls Road  
Graniteville, SC 29829  
803/663-3909