TABLE OF CONTENTS

CHAPTER FIVE WASTE COLLECTION AND TRANSPORTATION

CHAPTER SIX RECYCLING

CHAPTER SEVEN COMPOSTING, SOLID WASTE PROCESSING, WASTE-TO-ENERGY AND INCINERATION CAPACITY

CHAPTER EIGHT CLASS I DISPOSAL CAPACITY

LIST OF TABLES

LIST OF CHARTS

LIST OF MAPS

APPENDICES

Glossary

Active Life - the period from the initial receipt of solid waste at the facility until the Tennessee DEC approves final closure of the facility.[2]

Active Portion - the portion of a disposal facility where disposal operations are being or have been conducted and which is not a closed portion.[2]

Ash - the solid residue from burning of wood, coal, coke or other combustible materials used for heating, or from incineration of solid wastes, but excepting solid residue the storage or disposition of which is controlled by (agencies other than the Office of Pollution Control).

Authority or Solid Waste Authority - any public instrumentality organized pursuant to the provisions of the Solid Waste Management Act of 1991.[1]

Avoided Cost - costs not incurred because of diversion of waste from a landfill (e.g., disposal, environmental, opportunity costs).

Backyard Composting - the composting of organic solid waste, such as yard waste and household garbage, generated by a homeowner or tenant of a single or multi-family residential unit, where such composting occurs at the site of the residence.

Baling - a method of reducing and restraining (binding) solid waste volume by mechanical compaction to achieve high density per unit volume.[2]

Bulky Waste - large items of solid waste such as white goods, furniture, autos or large auto parts, trees, branches, stumps and other oversize wastes whose large size precludes or complicates their handling by normal collection, processing, or disposal methods.[2]

Buy-back Center - a recycling facility to which individuals bring recyclable materials for payment.

Capture Rate - tonnage of recyclables collected, divided by total tonnage of solid waste generated by participating households or commercial establishments.

Cell - a discrete volume of compacted solid waste that is enclosed by means of a barrier in a disposal facility.[2]

Class I Disposal Facility - a sanitary landfill which serves a municipal, institutional, and/or rural population and is used or to be used for disposal of domestic wastes, commercial wastes, institutional wastes, municipal wastes, bulky wastes, landscaping and land clearing wastes, industrial wastes, construction/demolition wastes, farming wastes, discarded automotive tires, and dead animals.[2]

Class II Disposal Facility - a landfill which receives waste which is generated by one or more industrial or manufacturing plants and is used or to be used for the disposal of solid waste generated by such plants, which may include industrial wastes, commercial wastes, domestic wastes, institutional wastes, farming wastes, bulky wastes, landscaping and land clearing wastes, construction/demolition wastes, discarded automotive tires, and dead animals. Additionally a Class II disposal facility may also serve as a monofill for ash disposal from the incineration of municipal solid waste.[2]

Class III Disposal Facility - a landfill which is used or to be used for the disposal of farming wastes, landscaping and land clearing wastes, and/or certain special wastes having similar characteristics.[2]

Class IV Disposal Facility - a landfill which is used or to be used for the disposal of construction/demolition wastes and/or certain special wastes having similar characteristics, and waste tires.[2]

Class V Disposal Facility - a landfarming facility.[2]

Class VI Disposal Facility - a surface impoundment used for disposal of solid waste.[2]

Closed Portion - a formerly active portion of a landfill which has undergone closure.[2]

Closure - the taking of those actions at the termination of a disposal operation which are necessary to finally close the disposal facility or disposal facility parcel.[2]

Co-composting - simultaneous composting of two or more diverse waste streams.

Collection - gathering of solid waste for subsequent management (i.e. landfilling, incineration or recycling).

Commercial Solid Waste - all types of solid waste generated by stores, offices, restaurants, warehouses, and other nonmanufacturing activities, excluding domestic and industrial wastes.[2]

Commingled Recyclables - A mixture of several recyclable materials in one container.

Composite Liner - a liner system composed of an engineered composed soil layer overlain by a synthetic flexible membrane liner.

Compost - the resulting product from a composting facility after having undergone biological decomposition, less residuals or recyclables, and which has been stabilized to a degree that it is potentially beneficial to plant growth and which is used or sold for use as a soil amendment, artificial topsoil, growing medium amendment, or other similar uses.

Compostable Material - solid organic waste that may be decomposed under controlled conditions by micro-organisms under aerobic or anaerobic conditions which result in a stable humus-like material free of pathogenic organisms (e.g., food wastes, yard wastes, and low moisture content wastewater sludge).[2]

Composting - an officially controlled method or operation whereby putrescible solid wastes are broken down through microbic action to a material offering no hazard or nuisance factors to public health or well-being.

Composting Facility - a facility which produces compost, but does not include backyard composting or normal farming operations.

Construction and Demolition Waste - wastes, other than special wastes, resulting from construction, remodeling, repair and demolition of structures and from road building. Such wastes include but are not limited to bricks, concrete and other masonry materials, soil, rock and lumber, road spoils, rebar, paving material.[2]

Convenience Center - any area which is staffed and fenced that has waste receptacles on site that are open to the public, when an attendant is present, to receive household waste, municipal solid waste, and recyclable materials.[1]

Curbside Collection - see door-to-door collection. at individual households or commercial building by public or private haulers, for subsequent transport to management facilities. Also known as mailbox collection.

Curing - the final stage of the composting process beginning in the later part of the mesophilic stage. During the curing process oxygen demand is reduced as the pile is recolonized by soil-dwelling micro-organisms. Once cured, the compost will not generate odors.

Department - the Tennessee Department of Environment and Conservation.[1]

Disease Vector - rodents, flies, and mosquitoes capable of transmitting disease to humans.[2]

Disposal - See Solid Waste Disposal.

Domestic Waste - any solid waste (including garbage, trash) derived from household (including single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas).[2] (See Household Waste.)

Door-to-Door Collection - collection at individual households or commercial building by public or private haulers, for subsequent transport to management facilities. Also known as mailbox or curbside collection.

Drop-Off - transport of individual solid waste materials (e.g. newspaper, cans, bottles) by individuals to specified area, for subsequent processing and transport to recycling facility.

EPA - United States Environmental Protection Agency.

Economies of Scale - increases in production capacity that reduce the average cost per ton of output.

Endangered or Threatened Species - any species listed in 50 CFR Part 17.[2]

Energy Recovery - beneficial use or reuse of solid waste through the controlled combustion of such waste to recover energy therefrom.[2]

Energy Recovery Facility - a facility for the recovery of energy or energy producing materials from the controlled processing of solid waste and the production of energy from said solid waste and other materials, including coal, for a heating and cooling system and/or for the production of electricity and process steam.[2]

Existing Facility - a facility which, on March 18, 1990 was a.) permitted or otherwise authorized by the Tennessee DEC and had not yet undergone final closure; or b.) not in operation and not yet permitted, but whose operator had submitted construction and operation plans to the Department.[2]

Facility - all contiguous land including structures and other appurtenances and improvements on the land used for processing or disposal of solid waste by an owner or operator. A facility may consist of several processing units or of several solid waste landfill units. A facility may not consist of a combination of processing and/or disposal or of disposal units of different classes.

Fixed Costs - costs that do not vary with level of output of a production facility (e.g. administrative costs, building rent, mortgage payments).

Flaring - burning of methane emitted from collection pipes at a landfill.

Floodplain - the lowland and relatively flat area adjoining inland and coastal waters, including flood-prone areas of offshore islands, that are inundated by the 100-year flood.

Fly Ash - particles that are carried off an incinerator grate by turbulence or volatilized material that condenses in the flue gas into particles.

Garbage - putrescible animal and vegetable wastes resulting from the handling, preparation, cooking, and consumption of food, including waste from markets, storage facilities, handling and sale of produce and other food products, except such materials that may be serviced by garbage grinders and handled as household sewage.

Groundwater - water below the land surface in the zone of saturation.

Hazardous Waste - a hazardous waste as defined in Rule 1200-1-11-.02(1)(c).[2]

Household Hazardous Waste - solid wastes discarded from homes or similar sources as listed in 40 CFR 261.4(b)(1) that are either hazardous wastes as listed by EPA in 40 CFR, Parts 261.33(e) or (f), or wastes that exhibit any of the following characteristics as defined in 40 CFR Parts 261.21 through 261.24: ignitability, corrosivity, reactivity, and TCLP toxicity.[1]

Household Waste - any waste material, including garbage, trash and refuse, and yard waste derived from households. Households include single and multiple residences, campgrounds, picnic grounds, and day-use recreation areas.[1] (See also Domestic Waste.)

Incinerator - an enclosed device using controlled flame combustion, the primary purpose of which is to thermally break down solid waste. Examples of incinerators are rotary kiln, fluidized bed, and liquid injection incinerators.[2]

Industrial Wastes - solid wastes produced in, or generated by, industrial or manufacturing processes. The term does not include commercial, domestic, mining, hazardous waste regulated under Subtitle C of RCRA, or oil and gas waste.[2]

Inorganic Waste - waste which does not originate from plants or animals.

Institutional Waste - all solid waste which are not special wastes, emanating from institutions such as, but not limited to, hospitals, health care facilities, nursing homes, laboratories, orphanages, correctional institutions, schools and universities.[2]

Integrated Solid Waste Management - a practice of using several waste management techniques to manage and dispose of specific components of the municipal solid waste stream. Waste management alternatives include source reduction, recycling, composting, energy recovery, incineration and landfilling.

Karst - a specific type of topography that is formed by dissolving or solution or carbonate formations, such as limestone or dolomite; it is characterized by closed depressions or sinkholes, caves, sinking and reappearing streams, and/or underground conduit drainage flow.[2]

Landfarming - the application of waste into and onto the surface soil for the purpose of attenuation. Synonyms include land application, land cultivation, land irrigation, land spreading, soil-farming, and soil incorporation.[2]

Landfill - any land used for the disposal of municipal solid waste or baled waste by filling or covering.[1]

Landscaping and Land Clearing Wastes - trees, stumps, brush, dirt, branches, leaves, clippings, etc. from landscaping and land clearing activities.[2]

Lateral Expansion - a horizontal expansion of the actual waste boundaries of a facility beyond the area previously authorized.

Leachate - a liquid that has passed through or emerged from solid waste and contains soluble, suspended, or miscible materials removed from such waste.[2]

Leachate Collection and Removal System - pipes used to collect leachate that settles on a liner and prevents it from migrating into groundwater.

Lead-Acid Battery - a battery that consists of lead and sulfuric acid and is used as a power source. It does not include small sealed lead-acid batteries which are batteries weighing 25 pounds or less, used in non-vehicular, non-SLI (starting, lighting and ignition) applications.

Lift - the compacted vertical thickness of a horizontal series of solid waste cells that have been constructed and upon which cover material has been placed. The cover may be either initial, intermediate, or final in application.[2]

Liner - a continuous layer of natural or man-made materials, beneath or on the sides of a surface impoundment, landfill, or landfill cell, which restricts the downward or lateral escape of wastes, waste constituents, or leachate.[2]

Local Government - the governing body of any incorporated place within the State including a village, town, city, county, and solid waste management authority.

Mailbox Collection - See *Door-to-Door Collection.*

Market - the transfer or sale of recovered materials to be used, reused, and recycled.[2]

Mass Burn - incineration without prior sorting or processing of solid waste, in a one-chamber combustion system under conditions of excess air.

Materials Recovery - retrieval of materials from solid waste.

Materials Recovery Facility (MRF) - facility for separating recyclables from mixed waste or for separating commingled recyclables; typically used to process materials for marketing.

Maximum Horizontal Acceleration in Lithified Earth Material - the maximum expected horizontal acceleration depicted on a seismic hazard map, with a 90 percent or greater probability that the acceleration will not be exceeded in 250 years, or the maximum expected horizontal acceleration based on a site-specific seismic risk assessment.

Medical Waste - all the infectious and injurious waste originating from medical, veterinary, or intermediate care facilities.

Mesophilic Stage - the biological stage in the composting process characterized by active bacteria which favor a moderate temperature range of 20° to 45°C (68° to 113°F). It occurs later in the composting process after the thermophilic stage and is associated with a moderate rate of decomposition.

Methane - an odorless, colorless, flammable, and explosive gas produced when organic wastes such as those contained in municipal solid waste undergo anaerobic decomposition. Methane is generated in municipal solid waste landfills and anaerobic compost processes.

Mixed Waste Paper - low-grade, potentially compostable paper, including noncorrugated paperboard, paperback books, telephone books, paper towels, and paper food containers.

Monofill - landfill for one type of waste only.

Municipal Solid Waste (MSW) - any garbage, refuse, industrial lunchroom or office waste, household waste, household hazardous waste, yard waste, and any other material resulting from the operation of residential, municipal, commercial, or institutional establishments and from community activities which are required to be disposed of in a Class I landfill, as defined in regulations adopted pursuant to Tennessee Code Annotated, Title 68, chapter 31; provided, however, that "municipal solid waste" does not include the following: (A) radioactive waste; (B) hazardous waste as defined in Tennessee Code Annotated, Section 68-46-104; (C) infectious waste; (D) materials that are being transported to a facility for reprocessing or reuse, but provided, further that reprocessing or reuse does not include incineration or placement in a landfill; and (E) industrial waste which may include office, domestic, or cafeteria waste, managed in a privately owned solid waste disposal system or resource recovery facility if such waste is generated solely by the owner of the solid waste disposal system or resource recovery facility.[1]

Municipal Waste - all solid wastes, which are not special wastes, resulting from the activities of a municipality conducted in management of public properties. This includes solid wastes such as street sweepings and collected park and roadside litter.[2]

MSW Composting - municipal solid waste composting is the controlled degradation of municipal solid waste. The MSW composting process includes the removal before composting of nonbiodegradable inorganic materials.

New Facility - a facility which, on March 18, 1990 was a.) in operation but not yet permitted or otherwise authorized by the TN DEC; or b.) not in operation and not yet permitted, and whose operator had not yet submitted construction and operational plans to the DEC.[2]

Nonferrous Metals - metals other than iron and steel.

100-Year Flood - a flood that has a 1-percent or greater chance of recurring in any given year or a flood of a magnitude equalled or exceeded once in 100 years on the average over a significantly long period.

Open Burning - the combustion of solid waste without (1) control of combustion air to maintain adequate temperature for efficient combustion, (2) containment of the combustion reaction in an enclosed device to provide sufficient residence time and mixing for complete combustion, and (3) control of emission of the combustion products.[2]

Open Dump - any officially recognized place, land or building which serves as a final depository for solid wastes, whether or not burned or buried, which does not meet the minimum requirements for a solid waste landfill, except approved incinerators, compost plants and salvage yards.

Operator - the person who is in charge of the actual, on-site operation of a solid waste management facility during any period of operation.[1]

Organic Waste - waste material containing carbon. The organic fraction of municipal solid waste includes paper, wood, food wastes, some textiles, leather, and yard wastes.

Participation Rate - a measure of the number of people participating in a recycling program compared to the total number eligible to participate; with curbside recycling programs, participation rate is measured by the percentage of eligible participants who set out recyclables for collection during a specified period of time.

Particulates/Particulate Matter - tiny pieces of matter resulting from combustion that may harm the health of those who breathe them.

Permit - the written authorization granted to a person by the TN DEC, to operate a solid waste processing or disposal facility, and whose actions or failure to act may result in non-compliance with the requirements of the permit.[2]

pH - a value indicating the degree of acidity or alkalinity; pH 7 = neutral, pH 0 = highly acid, pH 14 = highly alkaline.

Plant Available Nitrogen - the amount of nitrogen available for plant uptake. It consists of all of the nitrate and ammonia present in the soil and a fraction of the organic nitrogen present which can be expected to be converted to an inorganic form during a given year.

Point Source - any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff per 40 CFR 122.2.

Post-Closure Care - the taking of those actions after closure of a disposal facility or a disposal facility parcel which are necessary to meet the post-closure care requirements of Rule 1200-1-7-.04(8).[2]

Post-Consumer Waste - waste generated by the product's final consumer.

Pre-Consumer Waste - waste generated in processing materials or manufacturing them into final products.

Processing - preparing individual or mixed waste materials for subsequent management, using processes such as baling, magnetic removal, shredding.

Processing Facility - a combination of structures, machinery or devices utilized to perform solid waste processing, including other storage and processing areas. The term does not include collection vehicles.[2]

Procurement - the purchase of materials and services, usually, in the case of government procurement, through awarding contracts to low bidders.

Recovered Materials - those materials which have been diverted or removed from the solid waste stream for sale, use, reuse, or recycling, whether or not requiring subsequent separation processing.[1]

Recovered Materials Processing Facility - a facility engaged in the storage, processing, and resale or reuse of recovered materials.[1]

Recyclable Materials - those materials which are capable of being reused or returned to use in the form of raw materials or products, whether or not such materials have been diverted or removed from the solid waste stream.[1]

Recycling - any process by which materials which would otherwise become solid waste are collected, separated, or processed and reused or returned to use in the form of raw materials or products.[2]

Refuse-Derived Fuel (RDF) - fuel produced from solid waste that has undergone processing; fuel can be in shredded, fluff or densified pellet forms.

Region - a municipal solid waste region organized pursuant to Section 12(a) of the Solid Waste Management Act of 1991.[1]

Residuals - material removed from a processing or compost facility which cannot be processed or composted.

Resource Recovery - retrieval of materials or energy from solid waste, for purposes of recycling or reuse; the term *waste-to-energy* is used here for incinerators that recover energy.

Reuse - taking a component of solid waste and, possibly with some slight modification (e.g. cleaning, repair), using it again for its original purpose (e.g. refillable beverage bottles).

Salvaging - the controlled removal of waste materials for utilization from a solid waste processing or disposal facility.[2]

Scavenging - the uncontrolled removal of solid waste from a solid waste processing or disposal facility.[2]

Scrap - discarded or rejected industrial waste material often suitable for recycling.

Seismic Impact Zone - an area with a ten percent or greater probability that the maximum horizontal acceleration in lithified earth material, expressed as a fraction of the earth's gravitational pull (g), will exceed 0.10g in 250 years.

Self-Haul - waste hauling by the waste generator rather than by a contracted hauler.

Sewage Sludge - any sludge generated from a municipal, commercial, or industrial wastewater treatment plant which receives a significant quantity of domestic sewage.

Shredding - a process of reducing the particle size of solid waste through the use of grinding, shredding, milling or rasping machines.[2]

Sludge - any solid, semisolid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility exclusive of treated effluent from a wastewater treatment plant.[2]

Solid Waste - as defined in Tennessee Code Annotated, Section 68-31-103(7), but does not include recovered materials.[1]

Solid Waste Disposal - the process of placing, confining, compacting or covering solid waste except when such solid waste is for reuse, removal, reclamation or salvage.[2]

Solid Waste Management - the storage, collection, transfer, transportation, treatment, utilization, processing, or disposal of solid waste or any combination of such activities.[1]

Solid Waste Management Facility - any facility the primary purpose of which is the storage, collection, transfer, transportation, treatment, utilization, processing, or disposal, or any combination thereof, of solid waste. A recovered materials processing facility is not a solid waste management facility.[1]

Solid Waste Processing - an operation for the purpose of modifying the characteristics or properties of solid waste to facilitate transportation or disposal of solid wastes including but not limited to, incineration, composting, separation, grinding, shredding, and volume reduction.[2]

Solid Waste Stream - the system through which solid waste and recoverable materials moves from the point of discard to recovery or disposal.[1]

Source Reduction - any action or activity that reduces or eliminates the generation of a waste.[2]

Source Separation - separation at source of generation such as a household or commercial establishment of solid waste into different recyclable components.

Special Waste - includes sludges, bulky wastes, pesticide wastes, medical wastes, industrial wastes, hazardous wastes which are not subject to regulations under Department Rules 1200-1-11-.03 through 1200-1-11-.07, liquid wastes, friable asbestos wastes, combustion wastes, and other solid wastes that are either difficult or dangerous to manage and require extraordinary management. However, discarded automotive tires and dead animals shall not be included in this term.[2]

Storage - the containment of waste either on a temporary basis or for a period of years, in such a manner as not to constitute disposal of such wastes.

Structural Components - liners, leachate collection systems, final covers, run-on/run-off systems, and any other component used in the construction and operation of the landfill that is necessary for protection of human health and the environment.

Subtitle C - hazardous waste section of the Federal Resource Conservation and Recovery Act (RCRA).

Subtitle D - solid, nonhazardous waste section of the Federal Resource Conservation and Recovery Act (RCRA).

Superfund - common name for the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) to clean up abandoned or inactive hazardous waste sites. These sites have and will include closed solid waste landfills.

Thermophilic Stage - the biological stage in the composting process characterized by active bacteria which favor a high temperature range of 45° to 75°C (113° to 167°F). It occurs early in the composting process before the mesophilic stage and is associated with a high rate of decomposition.

Tipping Fee - price charged for delivering solid waste to transfer station, landfill, incinerator or recycling facility; usually expressed in dollars per ton or cubic yard.

Transfer Station - a combination of structures, machinery or devices at a place or facility which receives solid waste taken from municipal and private collection vehicles and which is placed in other transportation units for movement to another solid waste management facility.[2]

Transporter - a person engaged in the transportation of municipal solid waste collected or to be baled or processed, or disposed of in Tennessee by rail, highway, or water, in significant amounts. The amounts deemed significant shall be determined by the board and established by regulation.[1]

Treatment - any method, technique or process, including neutralization, designed to change the physical, chemical or biological character or composition of any hazardous waste in order to neutralize such character or composition or any hazardous waste, neutralize such waste or render such waste nonhazardous, safer for transport, amenable for recovery, amenable for storage or reduced in volume.

Treatment Facility - a location at which waste is subjected to treatment and may include a facility where waste has been generated.

Used Oil - any oil which has been refined from crude or synthetic, or recovered oil and, as a result of use, storage, or handling, has become unsuitable for its original purpose due to the presence of impurities or loss of original properties, but which may be suitable for further use and may be economically recycled or may be burned as fuel.[1]

Vector - See Disease Vector.

Waste Exchange - a computer and catalogue network that redirects waste materials back into the manufacturing or reuse process by matching companies generating specific wastes with companies that use those wastes as manufacturing inputs.

Waste Generation - the total non-hazardous solid waste generated by all residential, commercial, institutional, and industrial sectors which must be managed or disposed.

Waste Tire - a tire that is no longer suitable for its original intended purpose because of wear, damage, or defect.[1]

Wetlands - those areas that are defined in 40 CFR 232.2(r). Wetlands include, but are not limited to, swamps, marshes, bogs, and similar areas.

White Goods - discarded refrigerators, ranges, washers, water heaters, and other similar domestic and commercial appliances.[2]

Wood Waste - solid waste consisting of wood pieces or particles generated as by-products or waste by the manufacturing of wood products or the handling and storage of raw materials. These include, but are not limited to, sawdust, chips, shavings, bark, pulp, hog fuel, and log sort yard waste, but does not include wood pieces or particles containing chemical preservatives such as creosote, pentachlorophenol or copper-chrome arsenate. Wood waste may also include unusable trees and stumps.

Yard Waste - vegetative matter resulting from landscaping, lawn maintenance, and land clearing operation other than mining, agricultural, and forestry operations.[1]

1 The Solid Waste Management Act of 1991 and The Solid Waste Authority Act of 1991, House Bill 1252.

2 Solid Waste Processing and Disposal Facilities Rule Chapter 1200-1-7, amendments dated 10/27/91, 06/29/92, and 02/02/93.

EXECUTIVE SUMMARY

DESCRIPTION AND DEVELOPMENT OF REGION

Tennessee's Solid Waste Management Act of 1991 requires that each county/region develop a ten-year solid waste management plan for submission to the State. The North Central Planning Region (NCPR) consisting of Macon, Smith, and Trousdale Counties and their respective municipalities was formed to develop a regional solid waste management plan and to explore regional cooperation. It was determined that there are many benefits to cooperative efforts such as economies of scale, strength in combined resources, more available management options, and eligibility for larger State planning grants. The administrative board of the NCPR is comprised of five members representing each county.

CURRENT AND PROPOSED SOLID WASTE MANAGEMENT

It is estimated that in fiscal year 1993 the NCPR generated 28,874 tons of waste. The following table provides the methods used to manage that waste. Macon, Smith and Trousdale Counties each have their own Class I landfills (for mixed waste); all of which will close by October 1996.

Waste Generation and Management
Fiscal Year 1993

County	Total Waste Generation	Waste Management							
		Class I Disposal/ Incineration		Class IV Disposal		Recycled and Composted		Unmanaged Waste	
		Tons	%	Tons	%	Tons	%	Tons	%
Macon County	11,611	7,508	64.66%	0	0.00%	1,844	15.88%	2,259	19.46%
Smith County	10,958	10,568	96.44%	0	0.00%	390	3.56%	0	0.00%
Trousdale County	6,305	5,729	90.86%	0	0.00%	576	9.14%	0	0.00%
REGION	28,874	23,805	82.44%	0	0.00%	2,810	9.73%	2,259	7.82%

Source: Counties and Municipalites, July 1993; non-residential recycling survey, June 1993.

Collection, Transportation, and Disposal

The current waste management system varies by county. All municipalities provide door-to-door waste collection. Macon County relies on private haulers to collect waste in the unincorporated areas. Smith County provides six (6) convenience centers and Trousdale County provides one (1) convenience center for waste collection.

All three counties must develop other alternatives for waste disposal after 1996. They have evaluated options for Class I disposal including developing separate landfills for each county's own use; developing a three-county landfill; and contracting for disposal at a private facility or public facility outside the Region after existing capacity is consumed. The three counties plan to develop a regional transfer station at a Hartsville TVA site and contract for haul and disposal out of the region. However, Smith County retains the option to develop a landfill for its own use and not participate in the transfer station development. Smith County will continue this evaluation, and an amended plan will be developed by the Region if Smith County determines to proceed with landfill development. The amended plan will evaluate the options for the remaining counties and state their new chosen alternatives.

The following table provides the landfill alternatives evaluated by the three counties. The private contract estimates are from preliminary requests for proposals from private hauling/disposal firms. The private contract estimates include the cost of transfer station development, operation, and haul cost to both the transfer station and the disposal site.

Transportation and Disposal
Cost Per Ton

Macon County Landfill	Smith County Landfill	Trousdale County Landfill	Regional Landfill	Private Contract (Out-of-Region)
$68	$77	$103	$46	$38 - $55

Waste Reduction

The State requires that each county or region reduce its Class I or incineration waste disposal 25% by January 1, 1996. The base for comparison is the 1989 disposal estimates provided by the University of Tennessee. In addition, every county must provide for the collection of recyclable materials by that same date. Currently, each county except Smith has at least one collection program. Smith County will develop a collection program. The following table shows that the Region must take actions to reduce waste disposal by 25% within the January 1, 1996 time frame.

Waste Reduction
1993

County	Class I Disposal Annual Tons Per Capita		Waste Reduction Per Capita	
	1989	1993	TPY	%
Macon County	0.97	0.61	0.36	37%
Smith County	0.81	0.75	0.06	7%
Trousdale County	0.95	0.98	-0.03	-3%
REGION	0.90	0.81	0.09	10%

Other programs which can count toward waste reduction are source reduction, composting, problem waste diversion/recycling, and other waste diversion to Class IV landfills. Source reduction is a management technique which will be encouraged through the NCPR education program. Yard waste composting was evaluated for the NCPR and determined to be too costly at this time. However, counties and municipalities may consider small, very low-technology programs on a community level. Some problem wastes will be collected and diverted as required by the State and as discussed in a following section. Smith County is currently awaiting permitting approval for a Class IV landfill. This facility should be operational by December, 1994. It will provide services to the entire three-county region where no other Class IV facilities exist.

Problem Wastes

Each county is required to provide for the collection of certain problem wastes prior to January 01, 1995: waste tires, automotive fluids, and lead-acid batteries. Each of the NCPR counties will provide this collection and management prior to the required date. In addition, each county will participate in the State's household hazardous waste collection program; and the Region will evaluate possibilities for managing white goods. There are currently programs to manage litter in each county. These programs will continue.

Education

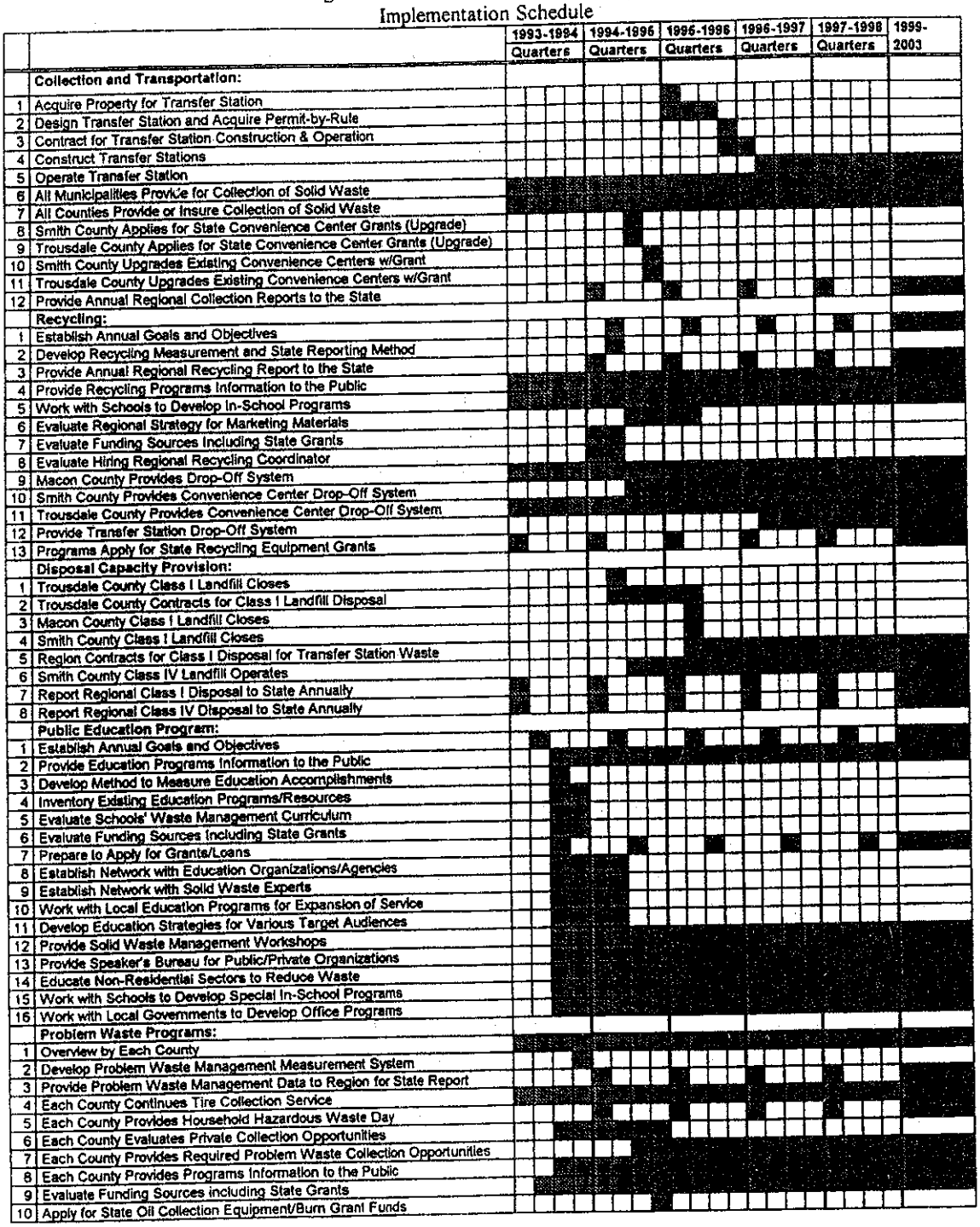
There are currently some education programs within the Region. However, the counties will combine efforts to provide more comprehensive education programs to offer information/education services to all residents. Trousdale County which has developed a successful litter and solid waste management education program and will continue this program and has agreed to provide technical and coordinating services to the other two counties. The State Highway Department Litter Grant Education funds will be incorporated into these efforts. The Region recognizes that continuous education is essential to implement a responsible and cooperative solid waste management plan and has given education a high priority.

IMPLEMENTATION AND BUDGET

The following tables provide the implementation schedule for all components of the NCPR solid waste management system and the system costs for the next ten (10) years. The implementation and cost schedules provide components which do not currently exist or which will be expanded. The accompanying Executive Summary Map provides the location of this proposed system.

This plan represents a regional system, and the NCPR will be responsible for elements of that system including a comprehensive education program, coordination of recycling efforts and marketing, and general overview of the region's implementation of this plan. However, there are many responsibilities which will remain with the individual counties as noted above such as solid waste, recyclables and problem waste collection. Costs will be shared according to population or waste generation.

Integrated Solid Waste Management Program
Implementation Schedule



Integrated Solid Waste Management Program
by Fiscal Year

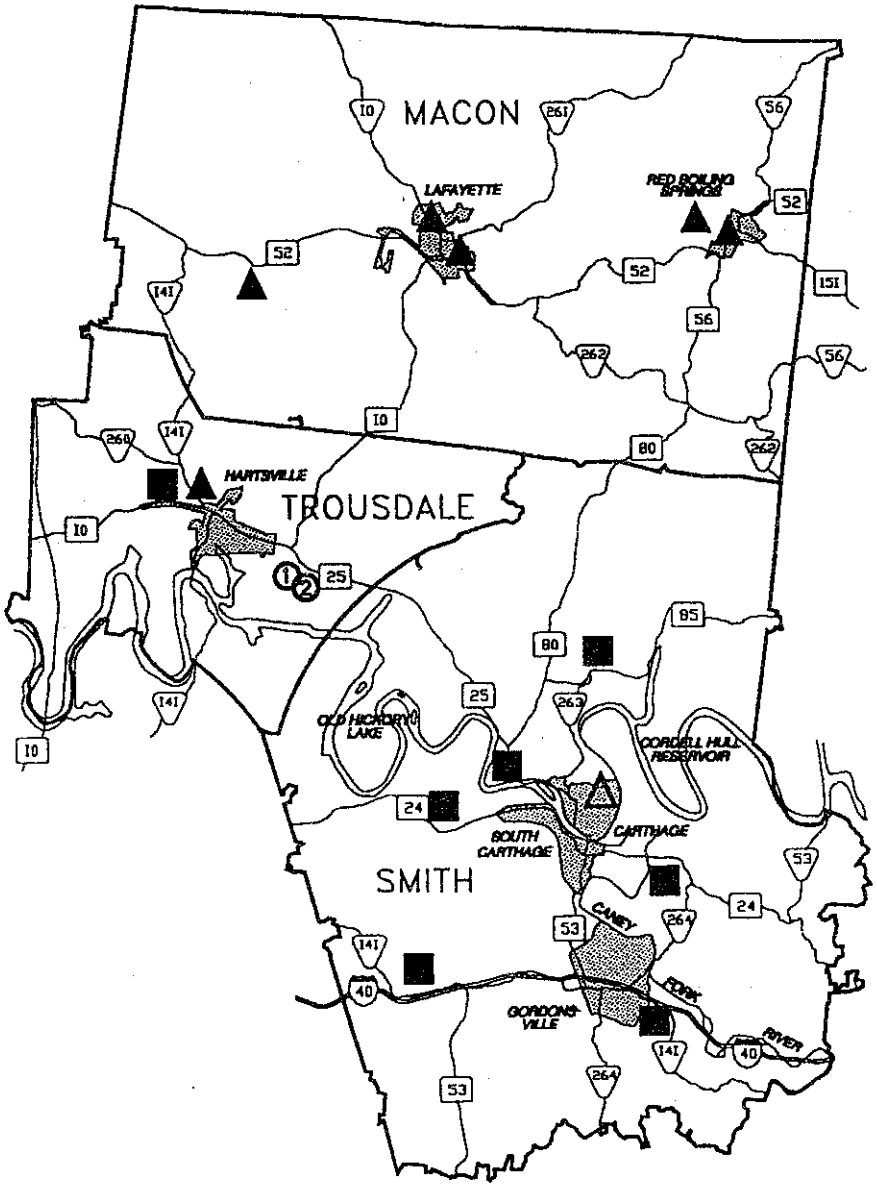
Activity	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003
Revenues:										
General Fund Allocations	$551,211	$593,548	$749,272	$974,392	$1,081,595	$1,177,163	$1,183,979	$1,202,328	$1,289,983	$1,305,609
User Fees	382,444	446,792	513,181	556,348	579,578	635,884	649,516	663,438	711,684	724,976
Tipping Fees	234,789	229,650	286,794	154,923	110,312	129,802	151,020	161,303	172,292	184,031
Sale of Materials	500	500	1,000	1,018	1,036	1,054	1,074	1,094	1,115	1,136
Convenience Center Grants	0	100,000	0	0	0	0	0	0	0	0
Recycling Equipment Grants	0	0	20,000	15,000	0	0	0	0	0	0
State Education Grants	0	22,500	0	0	0	0	0	0	0	0
State Litter Education Grants	4,145	7,228	10,311	10,311	10,311	10,311	10,311	10,311	10,311	10,311
State Litter Management Grants	57,517	54,434	51,351	51,351	51,351	51,351	51,351	51,351	51,351	51,351
State Oil Equipment Grants	0	16,950	0	0	0	0	0	0	0	0
Total Revenues	**$1,230,606**	**$1,471,602**	**$1,631,909**	**$1,763,343**	**$1,834,183**	**$2,005,565**	**$2,047,252**	**$2,089,825**	**$2,236,735**	**$2,277,414**
Expenditures:										
Collection and Transportation	$515,507	$633,550	$729,224	$755,114	$781,926	$809,691	$838,443	$868,218	$899,053	$930,985
Recycling Programs	23,500	27,548	57,543	69,382	66,098	68,411	70,806	73,284	75,849	78,504
Disposal	623,437	696,933	773,053	866,533	913,612	1,054,675	1,064,965	1,075,028	1,188,271	1,194,086
Education Program	4,145	29,728	10,311	10,311	10,311	10,311	10,311	10,311	10,311	10,311
Problem Waste Programs	64,017	83,844	61,778	62,003	62,236	62,477	62,726	62,984	63,251	63,528
Total Expenditures	**$1,230,606**	**$1,471,602**	**$1,631,909**	**$1,763,343**	**$1,834,183**	**$2,005,565**	**$2,047,252**	**$2,089,825**	**$2,236,735**	**$2,277,414**
Net Expense/Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Note 1.) The figures in this table are a summary of all budget tables in Chapters 5-10.

Executive Summary Map

Proposed Solid Waste Management System

North Central Planning Region



CHAPTER 1

DESCRIPTION OF THE REGION

GENERAL DESCRIPTION

The North Central Planning Region (NCPR) was formed by the three counties of Macon, Smith and Trousdale and their respective municipalities. Macon County contains the incorporated areas of Lafayette and Red Boiling Springs; Smith County contains Carthage, Gordonsville and South Carthage; Trousdale County has the town of Hartsville. The Region entities are presented in the following table with 1990 census population figure.

Table I-1
North Central Planning Region
Population of Counties and Municipalities

County/Municipality	1990 Population	County/Municipality	1990 Population
Macon County	**15,906**	**Trousdale County**	**5,920**
Unincorporated	11,360	Unincorporated	3,732
Lafayette, City	3,641	Hartsville, Town of	2,188
Red Boiling Springs, City of	905		
Smith County	**14,143**		
Unincorporated	10,015		
Carthage, Town of	2,386		
Gordonsville, Town of	891		
South Carthage, Town of	851		
		REGION	**35,969**

The Region comprises 736 square miles in north central Tennessee. The major physiographic features of this Region vary greatly. The outer rim of the Nashville Basin extends through northern Macon County. The Cumberland River serves as a southern boundary for Trousdale County and runs through Smith County. Lakes in the Region include Old Hickory Lake and Cordell Hull Reservoir which are part of the Cumberland River in Trousdale and Smith Counties, respectively.

Approximately 10% of the Region's population lives in urban areas, with some land used for commercial and industrial purposes. However, the dominant land use is agriculture. Map 1 provides the political boundaries, major roads, and major waterways of the Region.

RATIONALE FOR REGION FORMATION

The participating counties came together to form a Region to develop a regional solid waste management system. It was determined that there are many benefits to cooperative efforts such as economies of scale, strength of combined resources, similarities of solidwaste problemsmore alternatives to consider, and eligibility for larger State planning grants.

The NCPR has evaluated waste reduction and disposal alternatives on a regional and individual county basis. These analyses are described in the following chapters to explain criteria evaluated and the decision process.

INSTITUTIONAL STRUCTURE

The Administrative Board of the Region is comprised of five (5) members. By resolutions passed by each of the three member-counties, representation on the Board is allocated as follows:

COUNTY	REPRESENTATIVES ON BOARD	TERM
Macon	1	4 year
	1	2 year
Smith	1	6 year
	1	2 year
Trousdale	1	4 year

The officers of the Board include a Chairman, Vice-Chairman, and Secretary. A list of members, officers, and term of office; and the by-laws outlining Board powers and duties are provided in Appendix A.

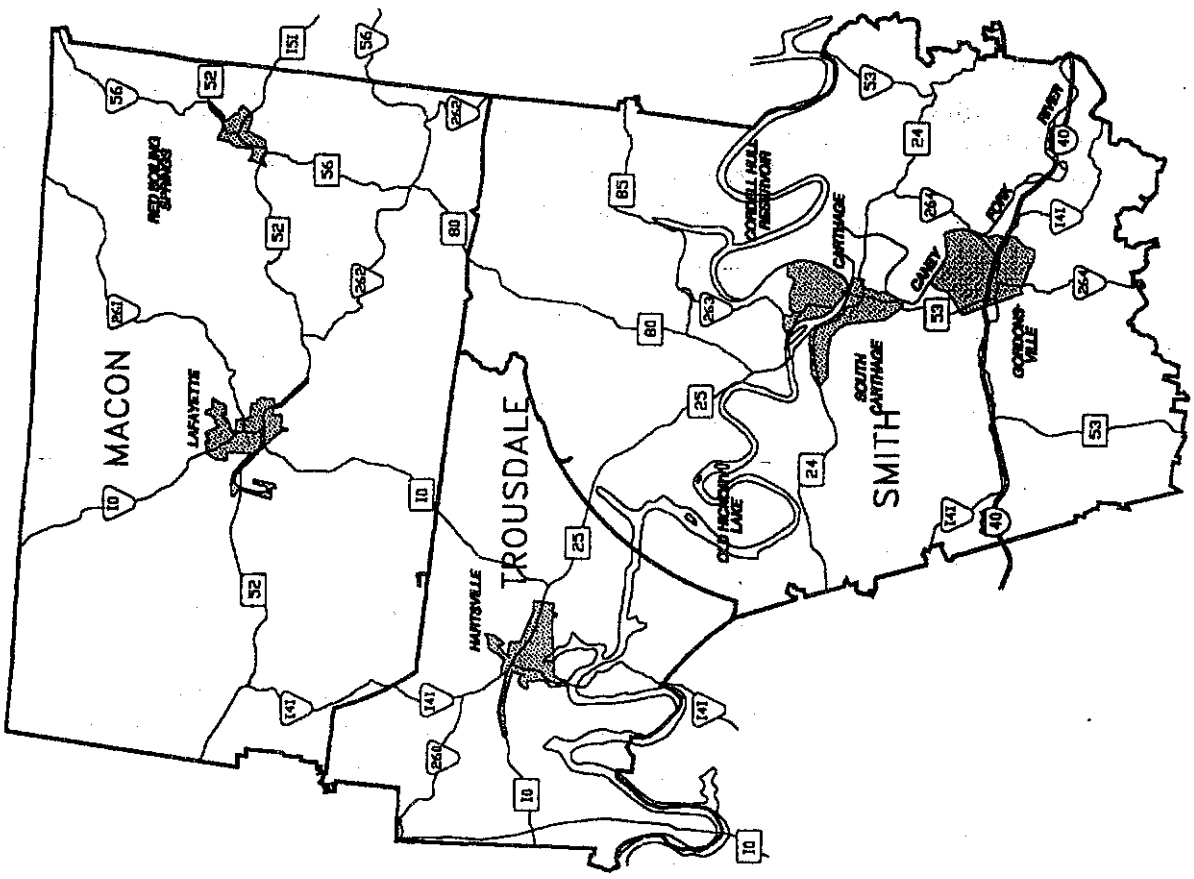
The Board members are directly accountable to their respective County Executives and County Commissioners by whom they were appointed. As such they provide direct communication with these individuals regarding the activities of the Region. In addition, the Region issues written periodic activity reports to all local governments in the three-county region.

A regional advisory committee structure has been established which includes the following three self-standing groups:

Map 1

Region Map

North Central Planning Region



- Elected Officials Advisory Committee;
- Technical Advisory Committee; and
- Public Education Advisory Committee.

A description of the composition and purpose of each of the three committees is provided in Appendix A.

Public meetings with these committees, as well as written correspondence, provide input into the regional planning process. In addition, all meetings are publicized and are open to the public. A description of meetings held during the planning process is provided in Appendix C.

DEMOGRAPHICS

In 1990 the three-county Region had a population of 35,969 that was approximately ninety (90) percent rural in nature. The University of Tennessee estimates the population decreased slightly by 1994 to 35,755. Of this, 16,053 (45%) reside in Macon County, 13,855 (39%) live in Smith County and 5,817 (17%) live in Trousdale County. UT projects the Region will continue to lose population through the ten year planning period.

County	Absolute Change 1994-2003	% Change 1994-2003
Macon	279	1.7%
Smith	- 605	-4.4%
Trousdale	- 248	-4.3%
REGION	- 574	- 1.6%

For the following reasons, it is believed that these projections may be slightly underestimated:

1) The anticipated impact of the northern loop of I-840 which, when completed (estimated 8-10 years), will increase in migration and economic activity, and to some extent in the western portion of Trousdale and Macon Counties;

2) Providing of sewer to the I-40 interchange at Gordonsville can be expected to add significantly to the economic activity of Smith County;

3) The enforcement of air quality non-attainment statutes will increase economic activity desirous of a middle-Tennessee location to look beyond the non-attainment area to Macon, Smith and Trousdale Counties; and,

4) The location of middle-Tennessee (within one day's delivery time of 75% of major U.S. markets), and its transportation advantages should afford the three counties increased economic development results in the coming years.

The regional dynamics noted above suggest that there will be an above average increase in economic activity throughout the Region in the next decade. If these assumptions are correct there will be a resultant increase in immigration, with obvious implications for the generation of solid waste.

According to UT, projected population for the Region in 1991 is 35,915, in 1992 it is 35,861, and in 1993 it is 35,808. The following tables provide demographic information about the Region by county including population density, urban/rural populations, population by sex and age, population over age 25 by education, population by housing, and projected population from 1994 to 2003.

Tables I-2 to I-7 provide a general overview of the current and projected demographics of the Region.

Table I-2
Population Density
1993

County	Area (Sq. Miles)	Population 1993	Average Density Population/Sq. Miles
Macon County	307	16,016	52
Smith County	314	13,949	44
Trousdale County	114	5,843	51
REGION	735	35,808	49

Source: Needs Assessments, 1991 (1990 Census).

Table I-3
Urban/Rural Population Distribution
1990

County	Urban		Rural	
	1990 Population	%	1990 Population	%
Macon County	3,641	22.9	12,265	77.1
Smith County	0	0.0	14,143	100.0
Trousdale County	0	0.0	5,920	100.0
REGION	3,641	10.1	32,328	89.9

Source: Needs Assessment, 1991(1990 Census).

Table I-4
Population Distribution by Sex and Age
1990

Population Age Groups	Total	Male		Female	
		No.	%	No.	%
0- 4	2,366	1,183	50.0	1,183	50.0
5-17	6,618	3,378	51.0	3,240	49.0
18-44	14,095	7,047	50.0	7,048	50.0
45-64	7,344	3,584	48.8	3,760	51.2
65 +	5,546	2,259	40.7	3,287	59.3
REGION	35,969	17,451	48.5	18,518	51.5

Source: Needs Assessment, 1991 (1990 Census).

Table I-5
Population Distribution by Education
Persons Aged 25 and Over
1990

Education Level	No.	%
Less than 9th Grade	35,064	70.1
High School (1-4 Years)	11,361	22.7
College (1-4 Years)	3,067	6.1
Post Graduate/Professional (>4)	524	1.1
REGION	50,016	100.0

Source: Needs Assessment, 1991 (1990 Census).

Table I-6
Distribution of Housing
By Type and Occupancy
1990

Type	Total Units
Single Family	
1 Detached	24,678
1 Attached	231
Multi-Family	
2-4	870
5-9	403
10+	206
Mobile Home/Trailer	5,324
Total Units	31,712
Total Occupied Units	29,048

Source: 1990 Census.

Table I-7
Population Projections
1994-2003

County	1994	1995	1996	1997	1998
Macon County	16,053	16,090	16,127	16,164	16,202
Smith County	13,885	13,821	13,758	13,695	13,632
Trousdale County	5,817	5,792	5,767	5,741	5,716
TOTAL	35,755	35,703	35,652	35,600	35,550

County	1999	2000	2001	2002	2003
Macon County	16,239	16,276	16,295	16,313	16,332
Smith County	13,570	13,508	13,431	13,355	13,280
Trousdale County	5,692	5,667	5,634	5,601	5,569
TOTAL	35,501	35,451	35,360	35,269	35,181

Source: UT Dept. of Sociology, and the Division of Information Resources, TDH. February 6, 1992 Revision (CENH13);

ECONOMIC ACTIVITY

This issue is partly addressed in the above section of this chapter. It should also be noted that the Region collectively is very diverse economically. The "regional economic ship" should float as the national economy ebbs and flows, and as noted in the above reference has every possibility of performing somewhat better than the nation.

There is one other possibility which could have a significant impact on Trousdale, Macon and Smith counties. That is, if the TVA should make a decision to produce power at the Hartsville nuclear plant site. Such a decision, which has a strong possibility, would result in immediate (construction phase) and long-term impacts (on-going operation) for all public services, particularly solid waste generation (especially demolition debris).

The following tables provide general information about the economic activity in the Region. Tables I-8 through I-10 provide general economic and employment data for the Region by county. Tables I-11 through I-13 provide waste generation and management information by county for commercial, industrial and institutional establishments. Table I-14 and I-15 provide revenue generation data for each of the counties.

Table I-8
Base Economic Data - 1991

County	Population 1991	MSA County	Total Employment	Total Earnings ($ x million)	Per Capita Income ($)	Population Below Poverty Line
Macon County	15,906	No	7,814.0	94.9	11,601	19.30%
Smith County	14,143	No	7,289.0	111	14,726	14.50%
Trousdale County	5,920	No	2,804.0	43.5	9,618	17.70%
REGION	35,969	N/A	17,907.0	249.4	N/A	17.15%

Source: Needs Assessment, 1991 (Bureau of Economic Analysis & Census Bureau).

Table I-9
Non-Agricultural Employment - 1990

County	Manu-facture	Con-struct	Trade	Finance	Service	Govern-ment	Trans/ Utilities	Total
Macon	2,494	425	970	411	1,038	658	263	6,259
Smith	1,811	368	1,126	178	1,025	710	218	5,436
Trousdale	966	217	432	106	577	126	148	2,572
REGION	5,271	1,010	2,528	695	2,640	1,494	629	14,267
%	36.95	7.08	17.72	4.87	18.50	10.47	4.41	100.00

Source: Needs Assessment, 1991 (U.S. Dept. of Commerce & Bureau of Economic Analysis).

Table I-10
Agricultural Employment
1990

County	Employment
Macon County	1,659
Smith County	1,510
Trousdale County	217
REGION	3,386

Source: Needs Assessment, 1991
(Bureau of Economic Analysis).

Table I-11
Commercial and Industrial Waste Generation
from Survey Responses
1992

Macon County - Businesses
Employing 10+

Company	1992 Disposed Tons	1992 Recycling Tons	1992 Total Generation
Lafayette Manufacturing Co.	0.55	760,022.24	760,022.79
American Greetings	52.00	1,281.00	1,333.00
Tennplasco, Inc.	2.08	93.26	95.34
Macon County General Hospital	39.00	17.30	56.30
Westside Elementary	1.30	0.78	2.08
Osh Kosh	9.46	0.00	9.46
Volunteer Sintered Products	0.22	0.49	0.71
Wal-Mart	2.66	120.00	122.66
Houchens	0.00	56.50	56.50
9 confidential surveys	195.60	27.51	223.11
SUBTOTAL	302.87	761,619.08	761,921.95
Recycled prior to 1985/part of manufacturing process		760,054.86	760,054.86
TOTAL	302.87	1,564.22	1,867.09

Source: Survey, June 1993

Smith County - Businesses
Employing 10+

Company	1992 Disposed Tons	1992 Recycling Tons	1992 Total Generation
Citizens Bank	8.10	0.12	8.22
Smith County Coatings, Inc.	0.00	2.00	2.00
James River Corporation	0.50	4,440.00	4,440.50
TennPlasCo	0.00	53.00	53.00
Bentley Harris Manufacturing	11.20	39.00	50.20
Jersey Miniere Corporation	41.06	204.46	245.52
10 Confidential Surveys	178.55	10,060.95	10,239.50
SUBTOTAL	239.41	14,799.53	15,038.94
Recycled prior to 1985/part of manufacturing process		14,410.00	14,410.00
TOTAL	239.41	389.53	628.94

Source: Survey, June 1993

Source: Survey conducted June 1993

Trousdale County - Businesses
Employing 10+

Company	1992 Disposed Tons	1992 Recycling Tons	1992 Total Generation
Bank of Hartsville	0.00	0.57	0.57
Trousdale County Elementary	0.00	2.90	2.90
Hartsville Garment Corporation	0.00	1.00	1.00
Foodland	0.00	8.32	8.32
9 Confidential Surveys	409.64	378.84	788.48
SUBTOTAL	409.64	391.63	801.27
Recycled prior to 1985/part of manufacturing process		22.48	22.48
TOTAL	409.64	369.15	778.79

Source: Survey, June 1993

Table I-12
Institutional Housing Waste Generation
Facilities with 100+ Persons

County	Number of Institutions	Number of Residents	Estimated TPY Waste
Macon County	0	N/A	N/A
Smith County	0	N/A	N/A
Trousdale County	0	N/A	N/A
REGION	0	N/A	N/A

Source: Needs Assessments, 1991 (telephone surveys).

Table I-13
Health Care Facility Waste Generation
Facilities with 50+ Beds

County	No Facilities	No. Beds	Infectious Waste Management		Estimated TPY Waste Generated
			On-Site/ Off Site	Type Treatment	
Macon County	2	162	off	contracted	N/A
Smith County	3	223	1 on/2 off	incinerate	4.2
Trousdale County	2	120	off	contracted	N/A
REGION	7	505			

Source: Needs Assessments, 1991(supplemented by Four Lake Authority survey March 1993).

Table I-14
Local Revenue Sources - 1990

County	Property Tax	Local Sales Tax	Wheel Tax	Local Waste Collection Fee	User Fee/ Tipping Fee	Other
Macon County	●	●	●		●	
Smith County	●	●			●	
Trousdale County	●	●			●	
REGION	3	3	1	0	3	0

Source: Needs Assessment, 1991 (County Executive offices).

Table I-15
Tax Revenue Data
Fiscal Year 1993

County	Total Assessed Property Value ($ x mill.)	Total Property Tax Revenue ($ x mill.)	Total Sales Subject to Sales Tax ($ x mill.)	Sales Tax Revenue ($ x mill.)	Number Registered Vehicles	Total Wheel Tax Revenue ($ x mill.)
Macon County	97.9	3.0	68.1	1.5	12,500	0.4
Smith County	86.7	2.4	70.4	1.4	14,850	0.0
Trousdale County	40.7	1.5	19.7	0.4	5,753	0.0
REGION	225.30	6.9	158.2	3.30	33,103	.4

Source: Survey of local governments, August 1993.

CHAPTER 2

CURRENT AND PROPOSED SOLID WASTE MANAGEMENT

WASTE STREAM GENERATION AND CHARACTERISTICS

The North Central Planning Region has estimated its current waste generation as shown in Table II-1. The total waste generation includes materials being disposed in Class I and Class IV disposal facilities, materials being recycled and composted, and unmanaged materials which are illegally dumped for disposal. The total waste generation for the Region is 28,874 tons. Map 2 provides the location of the various existing management facilities.

Table II-1
Total Solid Waste Generation and Management
Tons Per Year - Fiscal Year 1993

County	Total Waste Generation	Waste Management							
		Class I Disposal/ Incineration		Class IV Disposal		Recycled and Composted		Unmanaged Waste	
		Tons	%	Tons	%	Tons	%	Tons	%
Macon County	11,611	7,508	64.66%	0	0.00%	1,844	15.88%	2,259	19.46%
Smith County	10,958	10,568	96.44%	0	0.00%	390	3.56%	0	0.00%
Trousdale County	6,305	5,729	90.86%	0	0.00%	576	9.14%	0	0.00%
REGION	28,874	23,805	82.44	0	0.00%	2,810	9.73	2,259	7.82%

Source: Counties and Municipalites, July 1993; non-residential recycling survey, June 1993.

The Region has estimated the characterization of the waste generated by using the national waste characterization percentages. Table II-2 provides the tons per year by type material. It is anticipated that there will not be significant difference between the national material production and regional production. However, the Region may conduct their own evaluations at a later date once all regional waste is taken to a facility with scales.

Map 2

Current Solid Waste Management System

North Central Planning Region

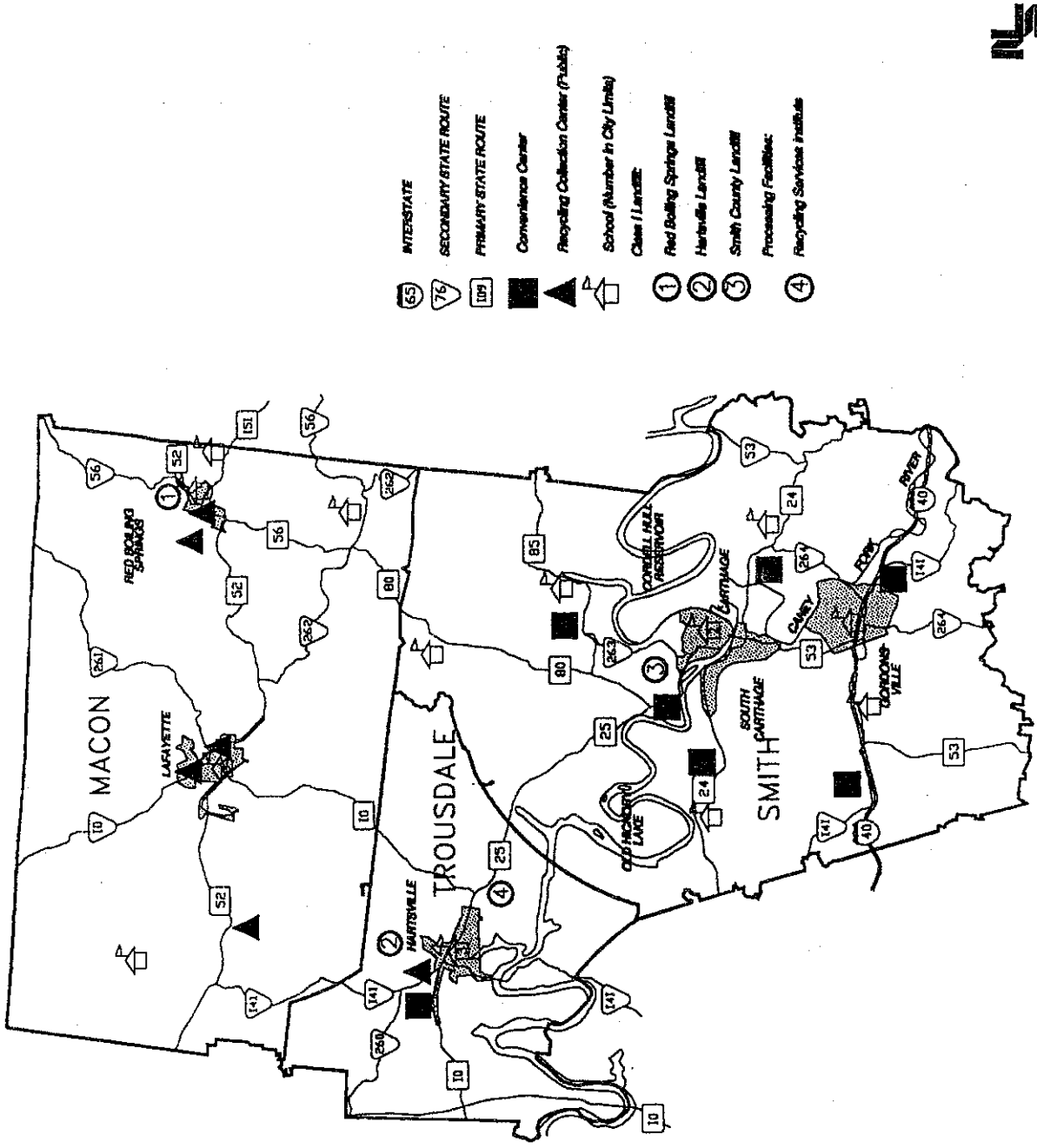


Table II-2
Solid Waste by Materials

Waste Category	National %	Region Tons Per Year
Paper & Paperboard	40.0	11,550
Glass	7.0	2,021
Ferrous Metals	6.5	1,877
Aluminum	1.4	404
Other Non-Ferrous Metals	0.6	173
Plastics	8.0	2,310
Rubber & Leather	2.5	752
Textiles	2.1	606
Wood	3.6	1,039
Food Waste	7.4	2,137
Yard Waste	17.6	5,082
Misc. Inorganic Waste	1.5	433
Other	1.7	491
REGION	100.0	28,874

WASTE COLLECTION AND TRANSPORTATION SYSTEMS

Waste collection and transportation services are provided throughout the Region. Publicly provided door-to-door collection services are provided in every municipality. Smith County provides six (6) convenience centers, and Trousdale County provides one (1) convenience center. Macon County does not provide public service. Table II-3 summarizes this information and provides the disposal destination of the waste. Table II-4 summarizes the separate waste collection provided by the various entities which could assist in planning for future composting, recycling, and diversion programs.

The State requires that at least 90% of each county be within the service area of collectors; otherwise, the County must provide a convenience center at a minimum for solid waste collection. Although Macon County does not provide a public waste collection and transportation system, all areas of the county are serviced by private haulers. This is further evaluated in Chapter 5.

Table II-3
Public Residential Solid Waste
Collection and Disposal

County/City	Collection			Disposal Facility		
	None	Door-to-Door (Service/wk)	Convenience Centers (No. Sites)	1	2	3
Macon County	●					
Lafayette		❶		X		
Red Boiling Springs		❶		X		
Smith County			❻		X	
Carthage		❶			X	
Gordonsville		❶			X	
South Carthage		❶			X	
Trousdale County			❶			X
Hartsville		❶				X

Disposal Facilities:
1. Red Boiling Springs Landfill
2. Smith County Landfill
3. Hartsville Landfill

Source: Survey of each local government, April, 1993.

Table II-4
Public Service
Separate Collection

County/City	Yard Waste						Rubbish/Bulky Items				Recyclables	
	Once/Week	Twice/Week	By Request Anytime	Spring & Fall Collection	Fall Collection (weekly)	Fall Collection (by request)	By Request Anytime	Annual Clean-up	Bi-Annual Clean-up	Drop-Off at Convenience Center	Business Curbside Collection	Drop-Off Collection
Macon County												●
Lafayette, City of					●				●		●	
Red Boiling Springs, City of						●		●				
Smith County												
Carthage, Town of		●					●					
Gordonsville, Town of									●			
South Carthage, Town of							●					
Trousdale County										●		●
Hartsville, Town									●	●	●	●

Source: Survey of local governments, April 1993.

SOURCE REDUCTION AND RECYCLING SYSTEMS

Summary of Existing Programs

A valid evaluation of source reduction efforts would require an intensive survey of all businesses and institutions. This is not anticipated to be done by the Region in the near future. However, it is anticipated that many businesses will practice source reduction simply to cut costs in resource purchases and waste management costs. The Region will encourage the private sector to implement source reduction methods and will provide educational mediums to teach source reduction methods. The Region has adopted a sample office waste reduction policy to encourage government offices to adopt.

There are limited recycling programs existing within the Region. yTable II-4 summarizes these programs which are discussed below. Recycling collection sites and processing centers are illustrated on Map 2 .

Macon County - Four drop-off centers are located throughout the County: Red Boiling Springs Landfill, Red Boiling Springs at the Hillwood Shopping Center, Lafayette at the Tennessee Vocational Training Center, and in Westside Community at the Macon County Ambulance base. This program began May 1, 1993. The landfill operator coordinates this program which currently markets and transports materials to the Resource Authority in Sumner County facility in Gallatin. It is anticipated that materials will be marketed to the Recycling Services Institute (RSI) in Trousdale County in the future.

This program accepts bi-metal cans, newsprint, and PET and HDPE plastics. The drop-off centers are open 24-hours per day. During the month of June 1993, 2.66 tons of recyclables were marketed.

In October, 1992 the City of Lafayette began collecting cardboard from local businesses. The program operates Monday through Friday and generates an estimated 280 tons per year which is recycled through RSI in Trousdale County.

Trousdale County/Town of Hartsville - A drop-off center is provided by the County at its convenience center. The center takes glass, plastic, aluminum cans, bi-metal cans, newspaper, cardboard, and appliances. Office paper is collected from local offices by County in-mates each Thursday. The appliances are sold to a scrap metal dealer; the quantity of appliances is unknown. The remaining materials are sold to Recycling Services Institute (RSI) which is located just outside Hartsville. An estimated 81,300 pounds or 41 tons per year are collected. This estimate includes materials extracted from litter collected in the County.

The City of Hartsville employees collect cardboard from local businesses. This program collected an estimated 330,000 pounds or 165 tons in 1992. The following is the estimated recyclables collected in Trousdale County in 1992.

Material	Pounds	Materials	Pounds
Newsprint	20,000	Bi-Metal Cans	3,000
Aluminum Cans	300	Office Paper	42,000
Plastic	2,000	White Goods	unknown
Glass	14,000	Corrugated Cardboard	330,000

Other Public Recycling Programs - There are several other small programs in the Region. These include churches, schools and other organizations. A survey of waste generators and their recycling efforts is shown in Table I-11 in Chapter I; this includes some of these programs but not all of them.

Private Non-Profit Recycling - The Recycling Services Institute (RSI) is a processing and drop-off facility located in Trousdale County. The facility began operation in the summer of 1990 with assistance from the Tennessee Valley Authority (TVA). An advisory board oversees the operation on leased TVA land. The facility consists of a 12,000 square foot building with a loading dock. Equipment includes a vertical baler used for corrugated cardboard; a vertical baler used for multi-purpose baling; a glass crusher; a paper shredder; a floor scale; a forklift; and a one-ton truck.

The facility is open for drop off from 9:00 A.M. to 2:00 P.M. Monday to Friday. The materials accepted include cardboard, newspaper, aluminum cans, bi-metal cans, plastics (PET and HDPE), glass, computer paper, ledger paper, and mixed paper. Several counties utilize this facility including Trousdale and Macon Counties within the NCPR.

Private For-Profit Recycling - There is one (1) private program in Smith County: D.T. McCall's which buys cardboard.

Evaluation of Existing Programs

Source reduction programs in the Region can be bolstered by education. Since source reduction is not as tangible as recycling, it will be important to emphasize source reduction as a very important component of solid waste management. It will be up to the Region to educate itself, its employees, residents and businesses. Local governments' public support of this method of solid waste management will provide greater awareness of source reduction by the general public. Education programs are discussed in Chapter 9.

The recycling programs represent a dedication by many member communities of the Region. However, greater emphasis will be given to a regional approach to take advantage of combined resources. These resources could include a Recycling Coordinator to provide guidance to each county/municipality in developing collection programs, determining which materials to focus upon, locating the most lucrative markets, marketing larger volumes of materials, and determining appropriate processing for markets.

Each county will provide at least one recyclable materials collection site. The counties will also work together in marketing their combined materials to take advantage of economies of scale. This is discussed further in Chapter 6.

WASTE PROCESSING, COMPOSTING, AND WASTE-TO-ENERGY/INCINERATION SYSTEMS

As Table II-5 indicates, there are no operating or planned composting facilities in the Region. Table II-6 provids the operating and planned incineration/waste-to-energy facilities in the Region.

Table II-5
Composting Facilities
Operating and Planned

Operating:

County	Facility Location	Tons of Waste Processed Annual	Composted Materials		
			Yard Waste	Sewage Sludge	Solid Waste
Macon County	N/A	0			
Smith County	N/A	0			
Trousdale County	N/A	0			
REGION	N/A	0			

Note: Derived from mixed waste at RASCO facility.

Planned:

County	Facility Location	Tons of Waste Processed Annual	Composted Materials		
			Yard Waste	Sewage Sludge	Solid Waste
Macon County	N/A				
Smith County	N/A				
Trousdale County	N/A				
REGION					

Note: Composted material will be diverted from waste stream at RASCO facility and sill be dependent upon total waste received.

Table II-6
Incinerators/Waste-to-Energy Facilities
Operating and Planned

Operating:

County	Facility Location	Design Capacity (Tons Per Year)	Effective Capacity (Tons Per Year)	Current Use TPY	Anticipated Operating Life (Years)
Macon County	N/A	0	0	0	0
Smith County	N/A	0	0	0	0
Trousdale County	N/A	0	0	0	0
REGION	N/A	0	0	0	0

Note: Derived from mixed waste at RASCO facility.

Planned: County	Facility Location	Design Capacity (Tons Per Year)	Effective Capacity (Tons Per Year)	Current Use TPY	Anticipated Operating Life (Years)
Macon County	N/A	0	0	0	0
Smith County	N/A	0	0	0	0
Trousdale County	N/A	0	0	0	0
REGION	N/A	0	0	0	0

Note: Derived from mixed waste at RASCO facility.

Recycling Services Institute (RSI)

This non-profit recyclable material processing facility is operated in Trousdale County and was described in a previous section of this chapter titled *Source Reduction and Recycling Systems - Private Non-Profit Recycling*.

DISPOSAL FACILITIES

Class II Disposal Facilities

The State definition of this type facility is a landfill which receives waste which is generated by one or more industrial or manufacturing plants and is used or to be used for the disposal of solid waste generated by such plants. The materials accepted may include industrial, commercial, domestic, institutional, farming, bulky, landscaping/land clearing, construction/demolition, tires, and dead animal wastes. Additionally, a Class II disposal

facility may also serve as a monofill for ash disposal from the incineration of municipal solid waste. There are no Class II facilities in the Region.

Class IV Disposal Facilities

The State defines a Class IV Disposal Facility as a landfill which may be used for the disposal of demolition and construction wastes, certain special wastes having similar characteristics, and waste tires. Smith County has plans to open a Class IV facility by January, 1995. There are no other Class IV facilities in the Region.

Class I Disposal Facilities

The State defines a Class I disposal facility as a sanitary landfill which serves a municipal, institutional, and/or rural population and may be used for disposal of domestic, commercial, institutional, municipal, bulky, landscaping/land clearing, industrial, construction/demolition, farm, tires, and dead animal wastes.

Table II-7 provides the quantities of waste disposed at Class I disposal facilities. Table II-8 breaks down the types of wastes disposed at these facilities by generator in 1991. Table II-9 provides the materials disposed at these facilities which could be diverted for other disposal or recycling. Table II-10 summarizes the Class I disposal facilities, their location, date of closure, location, permitted acreage, current tonnage accepted, and remaining capacity. Table II-11 provides the Class I facilities which will close before the year 2003. This includes all of the facilities in the Region.

Table II-7
Quantity of Solid Waste Disposed
at Class I Disposal Facilities and Incinerators
Tons Per Year - Fiscal Year 1993

County	Annual Tons Disposed	Population 1992	Waste Disposed Per Capita (TPY)
Macon County	7,508	15,980	0.47
Smith County	10,568	14,013	0.75
Trousdale County	5,729	5,868	0.98
REGION	23,805	35,861	0.66

Table II-8
Origin of Solid Waste Disposed
at Class I Disposal Facilities and Incinerators
Tons Per Year - 1991

County	Residential	Institutional/ Commercial	Non-Hazardous Industrial	Special	Other	Total
Macon County	4,303	1,434	1,434	0	0	7,171
Smith County	4,878	2,438	2,438	0	0	9,754
Trousdale County	2,900	1,276	1,624	0	0	5,800
REGION	12,081	5,148	5,496	0	0	22,725

Source: Needs Assessments, 1991

Table II-9
Solid Wastes Disposed
at Class I Disposal Facilities and Incinerators
Which Could Be Diverted
Tons Per Year - 1991

Facility/Location	Yard Waste	Sewage Sludge	Construction/ Demolition	Tires	White Goods	Total
Macon County	0	0	143	0	0	143
Smith County	negligible	0	488	195	98	781
Trousdale County	25	64	10	3	0	102
REGION	25	64	641	198	98	1,026

Source: Needs Assessment, 1991.

Table II-10
Existing Class I Disposal Facilities

County	Facility/Date of Closure/ Location	Permitted Acres	Current Rate of Waste Accepted (TPD)	1991 Remaining Capacity (tons)
Macon	Red Boiling Springs Landfill/ October 1996/Red Boiling Springs	35	6	15,817
Smith	Smith County Landfill,/ October 1996/ north of Carthage at end of Turner Hollow Road	14	34	85,848
Trousdale	Hartsville-Trousdale County Landfill/ October 1994/ Hartsville	6	22	14,300

Table II-11
Existing Class I Disposal Facilities
Expected to Close Before 2003

Landfill	County	1992 TPD	1992 TPY	Anticipated Date of Closure
Red Boiling Springs Landfill	Macon	20	7,196	10/8/96
Smith County Landfill	Smith	27	9,992	10/8/96
Hartsville/Trousdale County Landfill	Trousdale	15	5,617	10/8/94
TOTAL		62	22,805	

There are three (3) Class I disposal facilities in the Region: the Red Boiling Springs Landfill in Macon County, the Smith County Landfill, and the Hartsville/Trousdale County Landfill. These are described below.

Red Boiling Springs Landfill

This Class I facility is owned and operated by Macon County. Thirty-five (35) acres were permitted for this facility in 1976 by permit numbered SNL 56-102-0138. The contact person for this facility is Doyle Gaines, County Executive, Room 201 Courthouse, Lafayette, Tennessee 37083 telephone (615) 666-2363.

The facility is open Monday to Friday 8:00 A.M. to 4:00 P.M., and Saturday 8:00 A.M. to 12:00 P.M. and is used exclusively by Macon County residents, businesses, and haulers. An estimated 23 tons per day (5.5 days/week) or 6,544 tons per year are estimated for delivery to the facility in 1993. There have been truck scales at this facility since April 1993. Approximately 60% of this waste is residential, 10% commercial, 10% institutional, and 20% industrial.

The capital cost of this facility was $90,000. The annual operating costs for fiscal year 1991 were $150,000. The estimated average cost per ton for disposal is $20.92. A tipping fee of $20 per ton is charged. This facility has an estimated 6 acres of remaining capacity, and will operate until approximately October 1996. The remaining capacity was based upon current landfill disposal rates and not including illegally disposed wastes in the County.

Smith County Landfill

This Class I facility is owned and operated by Smith County. Fourteen (14) acres were permitted for this facility on October 26, 1988 by permit numbered SNL 80-102-0227. It is located north of Carthage at the end of Turner Hollow Road. The contact person for this facility is C.E. Hackett, County Executive, 218A Main Street, Carthage, Tennessee 37388 telephone (615) 735-2294.

The facility is open Wednesday 8:00 A.M. to 4:00 P.M., and Monday, Tuesday, Thursday and Friday 8:00 A.M. to 3:00 P.M. and is used exclusively by Smith County residents, businesses, and haulers. An estimated 28 tons per day (5.5 days/week) or 8,060 tons per year were delivered to the facility in 1991. There are truck scales at this facility. Approximately 30% of this waste is residential, 30% commercial, 15% institutional, and 25% industrial.

The capital cost of this facility was $255,631. The annual operating costs for fiscal year 1991 were $104,000. The estimated average cost per ton for disposal is $10.66. A tipping fee of $20 per ton is charged to the public; municipalities are charged on a per capita billing system. This facility has been assessed by the County's consulting engineer Ricky White. This consultant estimates that the current disposal at the Smith County Landfill will provide a footprint by October 09, 1993 to allow for continued disposal capacity until October 09, 1996 when the landfill will be required to close by State and Federal law.

Hartsville/Trousdale County Landfill

This Class I facility is operated on land leased jointly by the City of Hartsville and Trousdale County. Six (6) acres were permitted for this facility on December 24, 1986 by permit numbered SNL 85-102-0216. The contact person for this facility is R.H. (Woody) Badger, Jr., 349 River Road, Hartsville, Tennessee 37074, telephone (615) 374-2853.

The facility is open Monday - Friday 7:30 A.M. to 2:30 P.M. and is used exclusively by Trousdale County residents, businesses, and haulers. An estimated 15 tons per day (5.5 days/week) or 3,900 tons per year were delivered to the facility in 1992. There are no truck scales at this facility to weigh the waste. Approximately 50% of this waste is residential, 12% commercial, 10% institutional, and 28% industrial. An estimated 25 tons per year of land clearing/yard waste is delivered to the facility. Very little special waste is accepted accounting for an estimated 100 pounds per year of medical waste or gasoline contaminated soil.

The capital cost of this facility was $100,000 (leased land). The annual operating costs for fiscal year 1991 were $54,000. The estimated average cost per ton for disposal is $9.30. A tipping fees of $1.75 per cubic yard of uncompacted waste and $5 per cubic yard of compacted waste are charged. This facility has been assessed by the County's consulting engineer Barge, Waggoner, Sumner & Cannon Engineers. This consultant firm estimates that the current disposal at the Hartsville/Trousdale County Landfill will provide a footprint by October 09, 1993 to allow for continued disposal capacity until October 1994.

COSTS OF THE CURRENT SYSTEM

Table II-12 provides the regional solid waste management costs by the State's accounting codes. These figures were gathered from each municipality and county from their solid waste special revenue accounts. State law provides that any local government providing solid waste services must develop a special revenue account beginning with fiscal year 1993. An enterprise account will also be required for Class I landfills beginning fiscal year 1994. Chart II-1 is a summary of Table II-12 by percentage.

Chart II-1
Costs of Solid Waste Management System

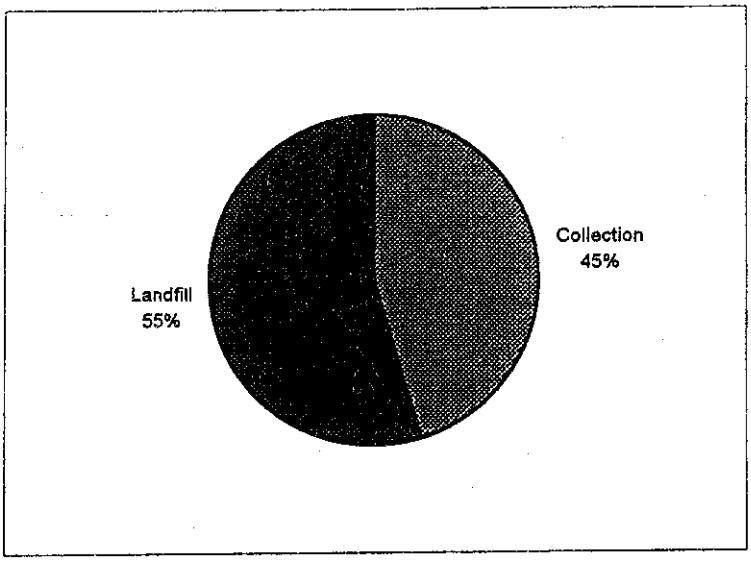


Table II-12
Costs of Solid Waste Management System
Fiscal Year 1993

MACON COUNTY
Including the Municipalities of Lafayette and Red Boiling Springs

Expenditure Category	Annual Cost	Expenditure Category	Annual Cost
Collection:		**Landfill:**	
Salaries	$125,904.69	Salaries	$49,399.01
Taxes & Fringe Benefits	$16,045.28	Taxes & Fringe Benefits	$2,384.93
Vehicle & Equipment Maintenance	$19,757.72	Vehicle & Equipment Maintenance	$16,730.12
Supplies & Uniforms	$3,390.81	Supplies & Uniforms	$2,126.13
Insurance	$0.00	Debt Service	$70.00
Capital Outlay	$73,046.77	Travel/License	$3,600.68
Tipping Fee	$11,682.00	Tipping Fee	$16,245.15
Deficiency Payment	$0.00	Engineering Fees	$7,011.10
Contract Hauler	$0.00	Miscellaneous	$5,348.85
Miscellaneous	$3,260.45	Site Development	$92,743.00
Total Collection Expenditures	$253,087.72	**Total Landfill Expenditures**	$195,658.97
		TOTAL SOLID WASTE EXPENDITURES	$448,746.69

SMITH COUNTY
Including the Municipalities of Carthage, Gordonsville, and South Carthage

Expenditure Category	Annual Cost	Expenditure Category	Annual Cost
Collection:		**Landfill:**	
Salaries	$77,857.00	Salaries	
Taxes & Fringe Benefits	$16,255.00	Taxes & Fringe Benefits	
Vehicle & Equipment Maintenance	$6,200.00	Vehicle & Equipment Maintenance	
Supplies & Uniforms	$2,200.00	Supplies & Uniforms	
Insurance	$16,690.00	Debt Service	
Capital Outlay (Debt Service)	$18,152.00	Travel/License	
Tipping Fee	$46,000.00	Tipping Fee	
Deficiency Payment	$0.00	Engineering Fees	
Contract Hauler	$0.00	Miscellaneous	
Miscellaneous	$485.00	Site Development	
Total Collection Expenditures	$183,839.00	**Total Landfill Expenditures**	$262,528.41
		TOTAL SOLID WASTE EXPENDITURES	$446,367.41

TROUSDALE COUNTY
Including the Municipality of Hartsville

Expenditure Category	Annual Cost	Expenditure Category	Annual Cost
Collection:		**Landfill:**	
Salaries	$42,093.74	Salaries	$72,396.05
Taxes & Fringe Benefits	$9,300.79	Taxes & Fringe Benefits	$15,256.07
Vehicle & Equipment Maintenance	$8,719.96	Vehicle & Equipment Maintenance	$20,827.55
Supplies & Uniforms	$999.26	Supplies & Uniforms	$8,617.82
Insurance	$0.00	Debt Service/Insurance	$8,388.39
Capital Outlay	$0.00	Travel/License/Rent	$2,700.00
Tipping Fee	$0.00	Tipping Fee	$0.00
Deficiency Payment	$0.00	Engineering Fees	$15,054.78
Contract Hauler	$0.00	Miscellaneous	$926.95
Miscellaneous	$33.80	Site Development	$0.00
Total Collection Expenditures	$61,147.55	**Total Landfill Expenditures**	$144,167.61
		TOTAL SOLID WASTE EXPENDITURES	$205,315.16

NORTH CENTRAL PLANNING REGION

Expenditure Category	Annual Cost	Expenditure Category	Annual Cost
Collection:		Landfill:*	
Salaries	$245,855.43	Salaries	$121,795.06
Taxes & Fringe Benefits	$41,601.07	Taxes & Fringe Benefits	$17,641.00
Vehicle & Equipment Maintenance	$34,677.68	Vehicle & Equipment Maintenance	$37,557.67
Supplies & Uniforms	$6,590.07	Supplies & Uniforms	$10,743.95
Insurance	$16,690.00	Debt Service	$8,458.39
Capital Outlay	$91,198.77	Travel/License	$6,300.68
Tipping Fee	$57,682.00	Tipping Fee	$16,245.15
Deficiency Payment	$0.00	Engineering Fees	$22,065.88
Contract Hauler	$0.00	Miscellaneous (Deficiency Payment)	$6,275.80
Miscellaneous	$3,779.25	Site Development	$92,743.00
Total Collection Expenditures	$498,074.27	Total Landfill Expenditures**	$602,354.99
		TOTAL SOLID WASTE EXPENDITURES	$1,100,429.26

*Line item expenditures do not include Smith County, Carthage, Gordonsville or South Carthage. Their total landfill expenditure of $262,528.41 was not broken down.

**Includes $262,528.41 from Smith County and municipalities.

REVENUES

Table II-13 provides the regional solid waste management revenues. As with the costs, this information was gathered from each municipality and county. The table provides the sources of revenue, type of unit charged, e.g. households, tons..., fee charged per unit, annual revenue, and percent of revenue allocated for solid waste management. In the case of the user fee, the fee per unit reflects average cost per unit per month for residential and commercial customers. Residential user fee charges range from $ 5.00 to $13.45 per house per month while commercial charges range from $ 5.00 to $ 150.00 per customer per month. Summary of information in Table II-13 is presented in Chart II-2.

Chart II-2
Revenues of Solid Waste Management System

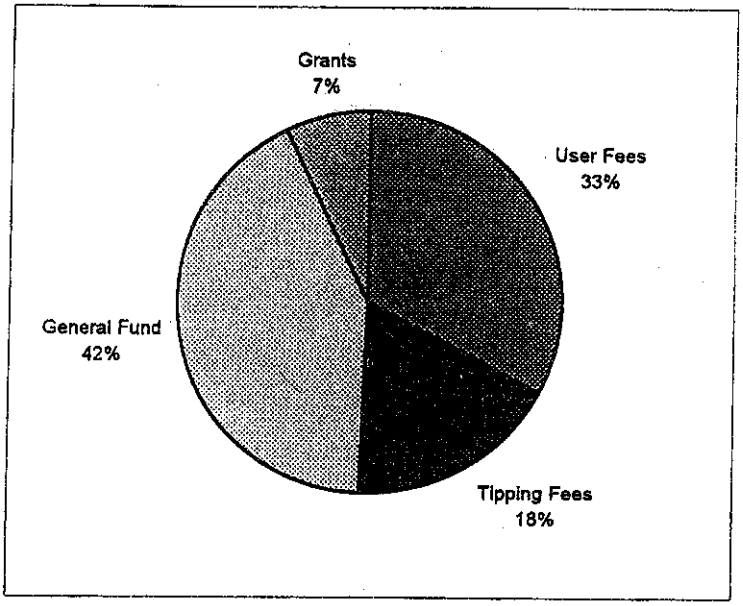


Table II-13
Revenues of Solid Waste Management System
Fiscal Year 1993

MACON COUNTY
Including the Municipalities of Lafayette and Red Boiling Springs

Revenue Category[2]	Type Unit[1]	Number of Units	Fee Per Unit	Annual Revenue
General Service Charges:				
Use Fee	Res. & Comm.	2676	$ 7.63/mo.	$ 244,906.82
Tipping Fees (at any class landfill or incinerator)	Ton	4913	$ 15.00/ton	$ 73,700.42
Surcharge (added to class I landfill tipping fee for State)			$	
Surcharge (host agency)			$	$ 0.00
Surcharge (general)			$	$ 0.00
Tax Base (General Fund)[3]				$ 182,880.02
Grants				$ 52,250.00
Commercial Fee or Special Assessment			$	$ 0.00
TOTAL SOLID WASTE REVENUE				$ 553,737.26

SMITH COUNTY
Including the Municipalities of Carthage, Gordonsville, and South Carthage

Revenue Category	Type Unit	Number of Units	Fee Per Unit	Annual Revenue
General Service Charges:				
User Fee	Res. & Comm.	1331	$ 7.36/mo.	$ 116,230.00
Tipping Fees (at any class landfill or incinerator)	Ton	6664	$ 15.00/ton	$ 99,962.23
Surcharge (added to class I landfill tipping fee for State)			$	$ 0.00
Surcharge (host agency)			$	$ 0.00
Surcharge (general)			$	$ 0.00
Tax Base (General Fund)				$ 242,452.83
Grants				$ 20,211.00
Commercial Fee or Special Assessment			$	$ 0.00
TOTAL SOLID WASTE REVENUE				$ 478,856.06

TROUSDALE COUNTY
Including the Municipality of Hartsville

Revenue Category	Type Unit	Number of Units	Fee Per Unit	Annual Revenue
General Service Charges:				
User Fee	Res. & Comm.	790	$ 6.42/mo.	$ 60,934.52
Tipping Fees (at any class landfill or incinerator)	Tons	2659 tons	$ 20.00/ton	$ 53,186.54
Surcharge (added to class I landfill tipping fee for State)			$	$ 0.00
Surcharge (host agency)			$	$ 0.00
Surcharge (general)			$	$ 0.00
Tax Base (General Fund)				$ 115,080.15
Grants				$ 20,211.00
Commercial Fee or Special Assessment (Sale Surplus)			$	$ 1,743.74
TOTAL SOLID WASTE REVENUE				$ 251,155.95

PUBLIC INFORMATION AND EDUCATION PROGRAMS

Central Middle School has done a 4-H Demonstration Recycling Project, and a "Trash Bash Day" for adults is provided in Macon County. Smith County has a CLEAN Tennessee program including an "Adopt-a-Highway" program and prison inmate litter pickup. Trousdale County sponsors a drop-off recycling program. The County has a CLEAN Tennessee program operated through the Trousdale County Litter Program providing recycling information on radio, distribution of car litter bags, solid waste and recycling curriculum in schools, and office paper recycling. A Recycling Coordinator is responsible for the public education program for litter prevention and recycling. All of the counties have newspapers and radio stations which provide audiences with solid waste information. The following Table II-14 represents schools in the Region which teach about recycling in their curriculum. Chapter 9 discusses the adequacy of existing programs and proposed programs.

Table II-14
School Recycling Curriculum

County	Total Schools	Schools with Recycling Curriculum
Macon County	6	5
Smith County	9	0
Trousdale County	2	2
REGION	17	7

PROBLEM WASTES

There are several types of problem wastes which every county is required to address. These wastes include tires, automotive fluids, and lead-acid batteries. State law requires that every county provide at least one site for the collection of these problem wastes by January 1, 1995 unless adequate collection already exists in the county. In addition, every Class I landfill must provide a temporary storage area for tires; this storage area may be used as the landfill host county's tire collection site.

Currently, all three counties provide for tire collection. Macon County collects tires at the Red Boiling Springs Landfill; Smith County collects tires at the Smith County Landfill; and Trousdale County collects tires at the Trousdale County Landfill. However, there are no designated collection sites for automotive fluids or lead-acid batteries in the three counties.

The current and future management of problem wastes are described in more detail in Chapter 10. This includes an implementation schedule to provide collection services and meet State requirement deadlines.

SYSTEM MAP FOR BASE YEAR (1993)

Map 2 provides the location of the Region's current solid waste management system. This includes convenience centers, collection service areas, transfer stations, recycling collection facilities, transportation routes, processing facilities, landfills and educational programs.

STRENGTHS AND WEAKNESSES OF EXISTING SYSTEM

The existing system of the three counties is highly independent. As elsewhere in Tennessee and the country, changing regulations have changed local governments' perspective on solid waste management. The new landfill regulations have made it impossible to maintain small, local landfills. In addition, other management regulations have also made it necessary for local governments to join together to pay for increased responsibilities.

The NCPR will close its existing Class I landfills within the next few years so other disposal options must be developed; problem waste management has been mandated and programs must be developed; and waste reduction has been mandated. Although the Region counties have addressed some of these concerns in their existing systems, the proposed system to more fully address them has necessarily incorporated a regional cooperative effort.

Table II-15 provides the existing and planned waste management capacity for each fiscal year through the year 2003. Table II-16 provides the planned expansion of existing facilities and proposed facilities to manage the Region's waste.

Table II-15
Waste Management Capacity
for Class I Disposal anD Incineration
Existing and Planned for 10 Years

	Tons of Capacity		
Year	Existing	Planned	Total
FY 1993	23,805	0	23,805
FY 1994	22,549	0	22,549
FY 1995	18,226	0	18,226
FY 1996	13,152	0	13,152
FY 1997	0	0	0
FY 1998	0	0	0
FY 1999	0	0	0
FY 2000	0	0	0
FY 2001	0	0	0
FY 2002	0	0	0
FY 2003	0	0	0

Table II-16
Planned Expansion and New Facilities
Expected to Operate for 10 Years or More

County	Facility			Location	Date Capacity Available	Permitted Acres Proposed	Design Rate of Waste Accepted (TPY)	Further Potential Expansion
	Name	Expan-sion	New					
Smith County	Municipal Solid Waste Landfill	X		Carthage	11/95	12	9000	Yes

CHAPTER 3

GROWTH TRENDS, WASTE PROJECTIONS AND PRELIMINARY SYSTEM STRUCTURE

POPULATION AND ECONOMIC GROWTH PROJECTIONS

Solid waste generation can be projected by evaluating future population and economic changes. A growing population will increase the total waste generation although not the per capita generation. A growing economy which includes new or expanded services, businesses and industries will also increase the total solid waste generation and may increase the per capita generation.

Table III-1 provides the per capita waste generation for each county which can be projected. The per capita estimate was calculated differently for each county depending upon the year that the best information was provided. The preferable data for this estimate is weighed waste and this was included where available. Table III-2 projects this per capita generation utilizing population projections developed by the University of Tennessee. The population projections were provided in Chapter 1. Table III-3 takes this data and adjusts the waste projections for economic growth. The economic growth was determined by the growth for the State in 1991 which was 3.2%.

Table III-1
Solid Waste Generation Per Capita
Tons Per Year - Fiscal Year 1993

County	Total Annual Waste Generated	Projected Population 1993	Annual Per Capita Generation Tons/Person/Year
Macon County	11,611	16,016	0.72
Smith County	10,958	13,949	0.79
Trousdale County	6,305	5,843	1.08
REGION	28,874	35,808	0.81

Sources: Table II-1

Table III-2
Projected Solid Waste Generation
Adjusted for Population Growth
Tons Per Year

County	1994	1995	1996	1997	1998
Macon County	11,719	11,746	11,773	11,800	11,827
Smith County	10,830	10,780	10,731	10,682	10,633
Trousdale County	6,224	6,197	6,171	6,143	6,116
REGION	28,773	28,723	28,675	28,625	28,576

County	1999	2000	2001	2002	2003
Macon County	11,854	11,881	11,895	11,908	11,922
Smith County	10,585	10,536	10,476	10,417	10,358
Trousdale County	6,090	6,064	6,028	5,993	5,959
REGION	28,529	28,481	28,399	28,318	28,239

Table III-3
Projected Solid Waste Generation
Adjusted for Population and Economic Growth
Tons Per Year

County	1994	1995	1996	1997	1998
Macon County	12,090	12,477	12,876	13,288	13,714
Smith County	11,181	11,539	11,908	12,289	12,682
Trousdale County	6,426	6,632	6,844	7,063	7,289
REGION	29,697	30,648	31,628	32,640	33,685

County	1999	2000	2001	2002	2003
Macon County	14,153	14,605	15,073	15,555	16,053
Smith County	13,088	13,507	13,939	14,385	14,846
Trousdale County	7,522	7,763	8,011	8,268	8,532
REGION	34,763	35,875	37,023	38,208	39,431

SOLID WASTE MANAGEMENT REQUIREMENTS

Table III-3 provides the waste which will have to be managed by the Region. The total waste stream is estimated to be 29,697 tons in 1994 and increasing to 39,431 tons in 2003. This includes materials which may be reduced by source reduction, recycling, or diversion from Class I facilities by current and anticipated waste reduction efforts to meet the State goal of 25% waste reduction by 1996.

Table III-4 provides the estimated waste which will require Class I disposal for the ten (10) year period. In order to determine ten (10) year Class I disposal volumes it was necessary to estimate how much waste material would likely be reduced from the total waste stream over the next ten (10) years and determine how it would be managed. Estimates for waste reduction were developed by evaluating current programs and resources for waste reduction programs in each county. Macon and Smith Counties have some waste reduction programs but they are very limited. It was assumed that it would take these counties longer to develop and establish successful waste reduction programs. Trousdale County has developed recycling programs which seem to be very effective for a rural county. These factors were considered in determining the estimated waste reduction percentages which are noted in Table III-4. It is estimated that 26,500 tons will require Class I disposal in 1994. This quantity is estimated to increase to 31,930 tons by the year 2003.

Table III-4
Projected Solid Waste Requiring Disposal
at Class I Disposal Facilities or Incinerators
Waste Generation Adjusted for Population, Economic Growth, and Waste Reduction
Tons Per Year

County	1994	1995	1996	1997	1998
Macon County	10,477	9,685	9,235	9,400	9,566
Smith County	9,953	9,201	8,773	8,930	9,088
Trousdale County	5,762	5,327	5,079	5,170	5,262
REGION	26,193	24,212	23,088	23,501	23,916

County	1999	2000	2001	2002	2003
Macon County	9,594	9,614	9,478	9,476	9,464
Smith County	9,115	9,134	9,004	9,002	8,990
Trousdale County	5,277	5,288	5,213	5,212	5,205
REGION	23,986	24,036	23,695	23,689	23,659

Note: The waste reductions were calculated as follows:

Macon County - 1994 (16%); 1995-1996 (18%); 1997-1998 (20%); 1999-2003 (25%)

Smith County - 1994 (5%); 1995-1996 (8%); 1997-1998 (10%); 1999-2003 (12%)

Trousdale County - 1994 (10%); 1995 (12%); 1996-1998 (15%); 1999-2003 (20%)

PRELIMINARY SYSTEM DESIGN

The Region will develop an integrated solid waste management system consisting of source reduction, recycling, problem waste diversion, and a Class I landfill. The following Table III-5 provides the anticipated management of all materials by 1996.

Table III-5
Proposed Management
of Total Regional Waste Stream by January 1, 1996

County	Source Reduction	Non-Res. Red/Rec	Recycling	Diversion to Class IV	Class I Disposal
Macon	0.40%	4.00%	0.80%	3.20%	31.60%
Smith	0.38%	3.80%	0.76%	3.04%	30.02%
Trousdale	0.22%	2.20%	0.44%	1.76%	17.38%
REGION	1.00%	10.00%	2.00%	8.00%	79.00%

EVALUATION CRITERIA FOR THE REGION

Each component of this system must be evaluated for need, economic viability, compatibility, and desirability. The need evaluation will include determining the estimated quantities of waste generated, types of materials, and programs/facilities required to manage that generation.

The economic viability evaluation will include an assessment of each components cost and revenue to enable economic comparison of alternatives. This assessment will include capital costs, operating costs, potential revenues, and markets for materials.

The compatibility evaluation will include an analysis of the existing system to determine if that system will be maintained, what new components must be added to complement the existing system, and what current components may be discontinued. This evaluation will be highly dependent upon how much independence the counties wish to retain.

Desirability of a system will in part be determined by public perception. This plan is to represent the will of the public which will be served by the proposed solid waste management system. Public participation is necessary to determine the wishes of the Region residents as well as to educate the public about the alternatives and consequences in choosing or not choosing them.

WASTE REDUCTION

BASE YEAR SOLID WASTE DISPOSAL

The goal of the State of Tennessee is to reduce by 25% the amount of solid waste disposed of at municipal solid waste (MSW) facilities: Class I landfills and MSW incinerators. The establishment of a base year and waste generated during that year per capita is necessary to provide a starting point for measurement of waste reduction per capita.

The University of Tennessee (UT) developed estimates of waste disposal for each county in the year 1989. This estimate was based upon available information from the Class I landfill records. These figures included waste exported out of county and excluded imported waste to the county, waste managed at facilities other than Class I landfills/incinerators, and unmanaged waste. When information was not available, the UT staff utilized default information in a statistical regression analysis. Although this may have been the best information available at that time, improved management in the counties including scales at the landfills have provided better records in many cases. The State will recognize other baseline data if a county can show that it has better data than provided by the 1989 study.

The following Table IV-1 provides the estimated base year disposal for each county. This is the total quantity of waste which must be reduced per capita by December 31, 1995.

Table IV-1
Base Year Waste Disposal

County	Base Year	Base Year Population	Base Year Waste Disposal (Tons)	
			Total	Per Capita
Macon	1989	16,300	15,807	0.97
Smith	1989	14,850	11,983	0.81
Trousdale	1989	6,300	5,977	0.95
REGION	-	**37,450**	**33,767**	**0.90**

Source: University of Tennessee, Managing Our Waste: Solid Waste Planning in Tennessee, February 1990.

WASTE REDUCTION TARGET FOR DECEMBER 31, 1995

Table IV-1 provides the baseline per capita waste disposal which must be reduced by December 31, 1995. A 25% reduction of this waste represents 0.225 annual tons per capita. The estimated total waste reduction in 1995 must be at least 8,033 tons (0.225 x 1995 regional population) to meet the goal. The actual test for achieving waste reduction will be disposal records at Class I

facilities, and a comparison of the 1989 base year disposal and the 1995 disposal. The following Table IV-2 illustrates that the Region has achieved a 19% waste reduction in fiscal year 1993.

Table IV-2
Waste Reduction
1989 and 1993

County	Class I Disposal Annual Tons Per Capita		Waste Reduction Per Capita	
	1989	1993	TPY	%
Macon County	0.97	0.61	0.36	37%
Smith County	0.81	0.75	0.06	7%
Trousdale County	0.95	0.98	-0.03	-3%
REGION	0.90	0.73	0.17	19%

Although disposal records will determine waste reduction, it is important to evaluate waste reduction program records as well. This documentation is a valuable planning tool for counties and regions to determine what programs are successful and what areas should be focused on for encouraging expansion.

Table IV-3 provides the tonnages of materials which are estimated to be recycled or diverted by year through the year 2003. The second column shows the estimated tons which were recycled in programs starting prior to 1985 or are recycled as part of the manufacturing process and would never be disposed because of the nature of the industry. These tonnages do not count as waste reduction by State definition but provide valuable information which may be important if markets diminish for the traditionally recycled industrial waste. The third column provides the estimated tons recycled or composted in programs established in 1985 or later. These quantities include both residential and non-residential programs. (The non-residential recycling survey was shown as Table I-11 in Chapter 1.) Column four provides the estimated tons to be disposed in facilities other than Class I landfills or incinerators. Currently, the only other disposal facility is a Class IV landfill in Sumner County. If other similar facilities are developed, the estimated tons diverted will increase from those shown in the table. The fifth column provides the economic incentives which would encourage residential and non-residential waste reduction. Currently, there are no incentives offered by the municipalities, counties or region. However, incentives such as disposal fees based on volume will be considered by the Region in the future.

Table IV-3

Estimated Waste Reduction

Year	Total Waste Generation		Source Reduction [1]		Non-Residential Reduction/ Recycling [2]		Recycled [3]		Class IV Disposal [4]		Class I Disposal [5]		Total Class I Waste Reduction Per Capita [6]	
	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%
1993	28,874	100.0%	0	0.0%	2,324	8.0%	489	1.7%	0	0.0%	26,064	90.3%	0.17	19%
1994	29,697	100.0%	297	1.0%	2,673	9.0%	535	1.8%	0	0.0%	26,193	88.2%	0.17	19%
1995	30,648	100.0%	306	1.0%	3,065	10.0%	613	2.0%	2,452	8.0%	24,212	79.0%	0.22	25%
1996	31,628	100.0%	633	2.0%	3,163	10.0%	1,581	5.0%	3,163	10.0%	23,088	73.0%	0.25	28%
1997	32,640	100.0%	653	2.0%	3,264	10.0%	1,958	6.0%	3,264	10.0%	23,501	72.0%	0.24	27%
1998	33,685	100.0%	674	2.0%	3,369	10.0%	2,358	7.0%	3,369	10.0%	23,916	71.0%	0.23	25%
1999	34,763	100.0%	695	2.0%	3,476	10.0%	2,433	7.0%	4,172	12.0%	23,986	69.0%	0.22	25%
2000	35,875	100.0%	1,076	3.0%	3,588	10.0%	2,870	8.0%	4,305	12.0%	24,036	67.0%	0.22	25%
2001	37,023	100.0%	1,111	3.0%	4,813	13.0%	2,962	8.0%	4,443	12.0%	23,695	64.0%	0.23	26%
2002	38,208	100.0%	1,146	3.0%	5,731	15.0%	3,057	8.0%	4,585	12.0%	23,689	62.0%	0.23	25%
2003	39,431	100.0%	1,183	3.0%	6,703	17.0%	3,154	8.0%	4,732	12.0%	23,659	60.0%	0.23	25%

Note: The 1993 figures are actual; the remaining figures are estimated. The estimated total waste generation comes from Table III-3.

1 Source reduction is expected to increase in households due to education and an increased awareness of the benefits of reducing waste at home.

2 Non-residential reduction/recycling is expected to increase due to increased awareness of the economic incentive associated with reduction of waste and the sale of recyclable materials.

3 Recycling is expected to increase due to education and the expansion and development of public programs.

4 Class IV landfill diversion opportunities will become available once Smith County develops its facility.

5 The Class I Disposal is the waste remaining after other waste management.

6 Class I disposal waste reduction is to be calculated by comparing each year's per capita Class I disposal to the 1989 per capita Class I disposal of 0.90 tons.

METHODS FOR MEETING THE WASTE REDUCTION TARGET

The State of Tennessee has developed waste reduction regulations which outline those activities which will be considered waste reduction. There are several methods as described below. However, it is important to note that the State will include waste reduction only from programs that began in 1985 or after.

1. ***Source Reduction*** *- This should be the primary focus of any waste management education program. Source reduction includes activities that reduce the toxicity or quantity of discarded materials before products are purchased, used, or discarded. This includes design, manufacture, and acquisition of materials so as to reduce the quantity and toxicity of waste produced at the place of origin. It can also include backyard composting and changing consumer habits to reduce packaging waste and toxicity of discarded products such as cleaners.*

2. ***Recycling*** *- Recycling is the transforming or remanufacturing of waste materials into usable or marketable materials or products. This involves collection, storage, processing, and marketing materials. The State of Tennessee will not consider materials recycled unless the materials are marketed for recycling, or are stored for recycling at a facility and at least 75% of the stored material is marketed within the succeeding twelve (12) months.*

3. ***Composting*** *- This is actually a form of recycling which is a controlled method breaking down putrescible wastes through microbic action rendering a material offering a non-hazardous product to be used for various land applications. Typically, composting is utilized for yard wastes although mixed municipal solid waste (MSW) can be composted as well. Composting will not be considered as waste reduction unless their is a market for the finished product. This can include use by local government.*

4. ***Diversion*** *- Any MSW diverted from a Class I facility or MSW incinerator to a Class III or Class IV landfill may be counted as waste reduction.*

5. ***Problem Waste Diversion*** *- The diversion of waste tires, used oil, lead-acid batteries, household hazardous wastes, and other problem wastes from a Class I disposal facility for recycling constitutes waste reduction. Problem wastes diverted and stored for recycling at a management facility until marketed qualifies as waste reduction.*

6. ***Mulching*** *- Any non-treated wood waste that may be converted to mulch will be considered waste reduction if it is marketed.*

Those practices that will **not** be considered waste reduction include:

- **Incineration** (however, incineration for fuel of Class IV type wastes such as pallets can be considered for waste reduction per the State);
- **Unmarketed compost;**

- **Unmarketed recyclables** (other than problem wastes and stored for recycling without being marketed as prescribed by Rule 1200-1-7-.09(2)(c) and as noted above); and
- **Illegal or unauthorized storage or disposal of municipal solid waste.**

STRATEGY FOR MEETING THE STATE WASTE REDUCTION GOAL

The North Central Planning Region is committed to reducing their waste stream as much as feasibly possible. This is the Region's goal not only to comply with the State mandate but to reduce the costs of their solid waste management, and to provide an environmentally safe and sound solid waste management system. The Region has considered all forms of waste reduction as discussed below.

Source Reduction

This type of waste reduction is perhaps the most important form of waste reduction as it eliminates waste *before* its generation; this then eliminates the need for management. However, it is also the most difficult type of waste reduction to measure. This may be changing since there is an ever increasing awareness about the need for source reduction and its benefits. Manufacturers may be the most inclined to track their waste volumes before and after implementing source reduction programs.

The NCPRwill include source reduction in its public information and education program. The institutional, commercial, and industrial sectors will be advised about ways to save production and waste management costs through source reduction. The residential sector will also be provided with source reduction information which they can utilize in their homes: backyard composting, reuse of materials, buying in bulk, non-toxic alternatives to household cleaners....

In addition, government offices will adopt office policies to reduce the volume of waste generated in their offices. These policies may include copying on both sides of paper, keeping file copies on computer disks only, buying locally to avoid accumulating waste mail packaging, and buying recycled products.

Recycling

Several recycling programs are currently available in the Region. Public programs exist in two of the three counties: Macon and Trousdale. Smith County will develop a public recycling program by the mandated date of January 1, 1996. Once each county has developed their recycling programs, the Region counties will market their materials cooperatively to take advantage of larger quantities and cooperative processing and quality controls.

The non-residential sectors will be encouraged to begin or expand existing recycling programs and to participate in the public programs where appropriate. A non-residential recycling survey has shown that recycling programs have been implemented in many businesses in the Region. The results of the survey are provided in Chapter 1.

Composting

Some yard waste composting is occurring on a very small scale in some Region communities. However, it is estimated that a regional yard waste composting program will cost $30/ton.

It is important to note that some yard waste composting may be feasible on a small-scale, low-technology level. This is evident in existing small programs. However, the amount of yard waste generated is not anticipated to support a regional effort at this time using higher technologies to manage the yard waste.

Diversion

No Class III or Class IV landfills exist in the Region.

It is estimated that the remaining three counties in the Region could develop a Class IV facility at a cost of $48/ton. This estimate is based upon an estimated 2,300 tons per year or 10% of the total three-county waste stream. This estimate includes materials acceptable at a Class IV facility: demolition, construction, special wastes with similar characteristics as the aforementioned, and processed waste tires.

Smith County is currently developing a Class IV facility which when completed (est. January, 1995), will be of service to the Region.

Problem Waste Diversion

Every county is required to provide for the collection and management of three problem wastes: tires, lead-acid batteries, and automotive fluids. This will be accomplished prior to the State mandated deadline of January 1, 1995.

The diversion of any of these materials from a Class I facility will count toward waste reduction. In addition, any other problem waste diversion will be included in the waste reduction estimate as well. Other problem wastes which the Region counties will address are white goods (appliances) and household hazardous waste.

Mulching

This type of waste reduction would require the purchase of equipment to process waste wood. It is not anticipated at this time that the Region counties will provide this service. However, if the counties develop a yard waste composting program in the future, they may consider developing a complementary mulching program as well.

Waste Reduction Incentives and Disincentives

The Region will consider adoption of regulatory bans to keep yard wastes and white goods (appliances) out of Class I disposal facilities. This is to provide yard wastes for potential composting programs, and appliances to be used in the Region's white goods recycling program.

The counties will also consider the imposition of a volume-based waste fee. This could entail the development of a county-authorized garbage bag or sticker system. The bag (maybe in a bright color to be distinguished from store-bought bags) or sticker (to be placed on the bags) must be purchased from a county-authorized agent. The authorized agent could be a utility company or grocery store. This system will provide that the waste generator pays for his or her waste by the number of bags of waste that must be disposed. This system curtails the need for expensive equipment to weigh and record the waste generated by each generator.

Summary

Table IV-4 provides the estimated waste reduction by material. A previous table in chapter 2 (Table II-2) provided the estimated current waste characterization. The materials in that table were analyzed to estimate the probable quantities of each material that might be reduced, recycled, or diverted in 1995. Although this is a rough estimate at this time, future plans may be able to project more accurate figures once more Region recycling programs are underway and more historical records are available.

Table IV-4
Projected Waste Reduction by Material
1995

Waste Category	Percent Reduction of Total Waste	Total Region Generation Tons Per Year	Tons Reduced
Paper & Paperboard	40.00%	12,259	4,904
Glass	8.00%	2,145	172
Ferrous Metals	30.00%	1,992	598
Aluminum	35.00%	429	150
Other Non-Ferrous Metals	15.00%	184	28
Plastics	2.00%	2,452	49
Rubber & Leather	0.00%	766	0
Textiles	0.00%	644	0
Wood	20.00%	1,103	221
Food Waste	0.00%	2,268	0
Yard Waste	5.00%	5,394	270
Misc. Inorganic Waste	5.00%	460	23
Other	5.00%	521	26
REGION		30,648	6,436

Another way of looking at recycling and its future is to evaluate the sources of such programs. Table IV-5 shows the total tons which are estimated to be recycled in 1995 by sector. Current programs were evaluated to determine the current tonnages recycled by the residential, commercial, institutional, and industrial sectors. A survey of the non-residential sectors has assisted in generating these numbers. These numbers were then projected to represent anticipated total 1995 recycling estimates.

Table IV-5
Projected Waste Reduction by Economic Sector
Tons Per Year - 1995

County	Residential		Commercial		Institutional		Industrial		Total Reduction
	%	Tons	%	Tons	%	Tons	%	Tons	
Macon	14%	368	13%	335	13%	335	60%	1,544	2,574
Smith	14%	349	13%	318	13%	318	60%	1,468	2,446
Trousdale	14%	202	13%	184	13%	184	60%	850	1,416
REGION	14%	919	13%	837	13%	837	60%	3,862	6,436

Projected waste reduction by year is necessary to anticipate how much material must be managed by recycling, composting, and diversion methods. It is also necessary to estimate how much remaining materials must be managed as waste for disposal. Table IV-6 projects the estimated waste reduction by year from 1994 - 2003.

Table IV-6
Projected Waste Reduction by Year
Tons Per Year

County	1994	1995	1996	1997	1998
Macon County	1,402	2,574	3,416	3,656	3,908
Smith County	1,332	2,446	3,245	3,473	3,712
Trousdale County	771	1,416	1,879	2,011	2,149
REGION	3,504	6,436	8,540	9,139	9,769

County	1999	2000	2001	2002	2003
Macon County	4,311	4,736	5,331	5,808	6,309
Smith County	4,095	4,499	5,065	5,517	5,993
Trousdale County	2,371	2,605	2,932	3,194	3,470
REGION	10,777	11,839	13,328	14,519	15,772

IMPLEMENTATION SCHEDULE, BUDGET, AND PROGRESS REPORTS

The waste reduction strategies schedule and budget are addressed in Chapter 6 - Recycling and Chapter 9 - Public Information and Education.

The annual progress reports will be the responsibility of each county. These reports must be filed with a regional coordinator to be submitted to the State each year. Each county will maintain waste reduction records by tracking sales of recyclable/reusable materials and maintaining records of diverted wastes; each county will also be responsible for maintaining records of wastes disposed in Class I facilities.

CHAPTER 5

WASTE COLLECTION AND TRANSPORTATION

CURRENT COLLECTION AND TRANSPORTATION SYSTEM

The current collection and transportation system was discussed in Chapter 2. All governmental units provide door-to-door collection except as follows: Smith County provides six (6) convenience centers; Trousdale County provides one (1) convenience center; and Macon County does not provide any waste collection.

EVALUATION OF CURRENT SYSTEM

An evaluation of this system shows that adequate collection service is provided throughout the Region. The State's proposed convenience center regulations require that at least 90% of each county shall be within the service area of a solid waste collector. If less than 90% have access to collection, the county is required to provide at least one convenience center or a higher level of collection service.

Macon County, does not provide any collection services for household waste. However, private hauler information shows that at least 90% of this area is within service areas for collection. Map 3 provides the collection service areas in Macon County. Table V-1 provides the number of households which are located in collection service areas as well as the number that are estimated to be actually subscribing for service. Table V-2 provides the collection services by service area, provider, households served, and county of disposal destination. Map 5 shows the existing and proposed waste collection and transportation facilities as well as the existing movement of waste in the Region.

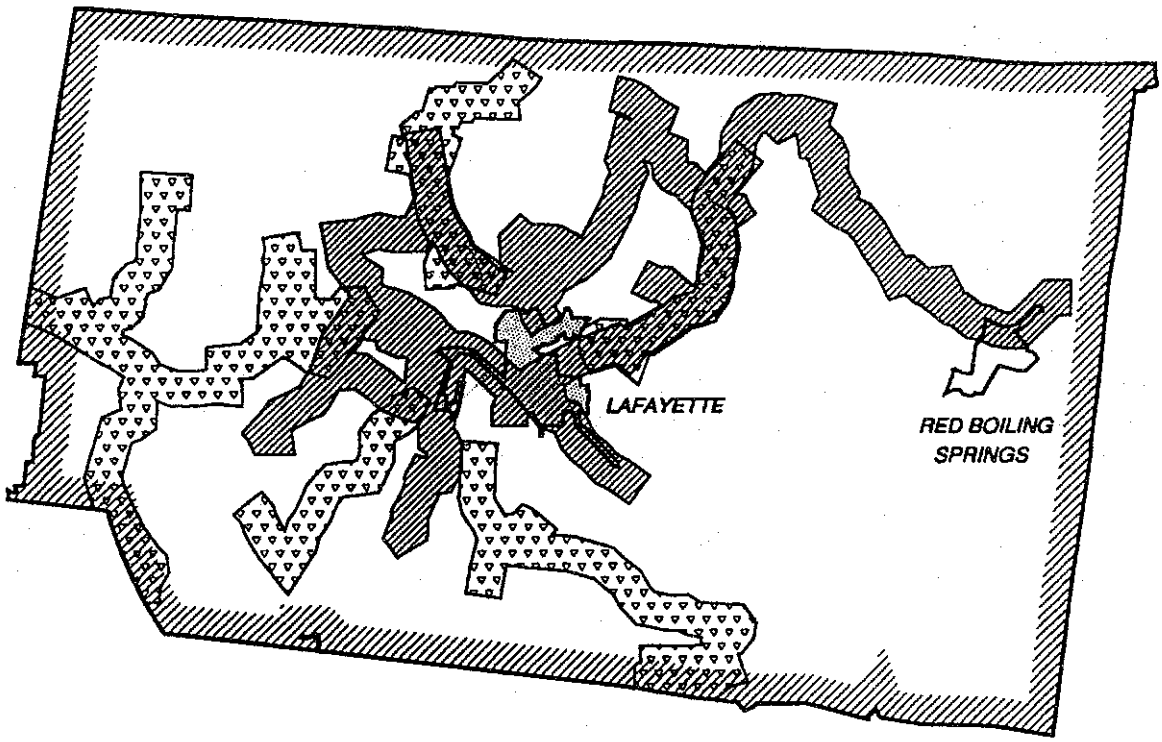
Table V-1
Households in Waste Collection Service Areas
and Households Subscribing for Service

County	Total	Households in Service Area		Households Subscribing	
		No.	%	No.	%
Macon	6,159	6,159	100.00%	3,138	50.95%
Smith	5,358	5,358	100.00%	5,358	100.00%
Trousdale	2,261	2,261	100.00%	2,261	100.00%
REGION	13,778	13,778	100.00%	10,757	78.07%

Source: Table V-1

Map 3

Waste Collection Service Areas



MACON COUNTY

MUNICIPAL COLLECTION SERVICE

MACON TRASH DISPOSAL (ENTIRE COUNTY)

A & J DISPOSAL

ACE TRASH DISPOSAL

MAP 4

Waste Collection and Transportation

North Central Planning Region

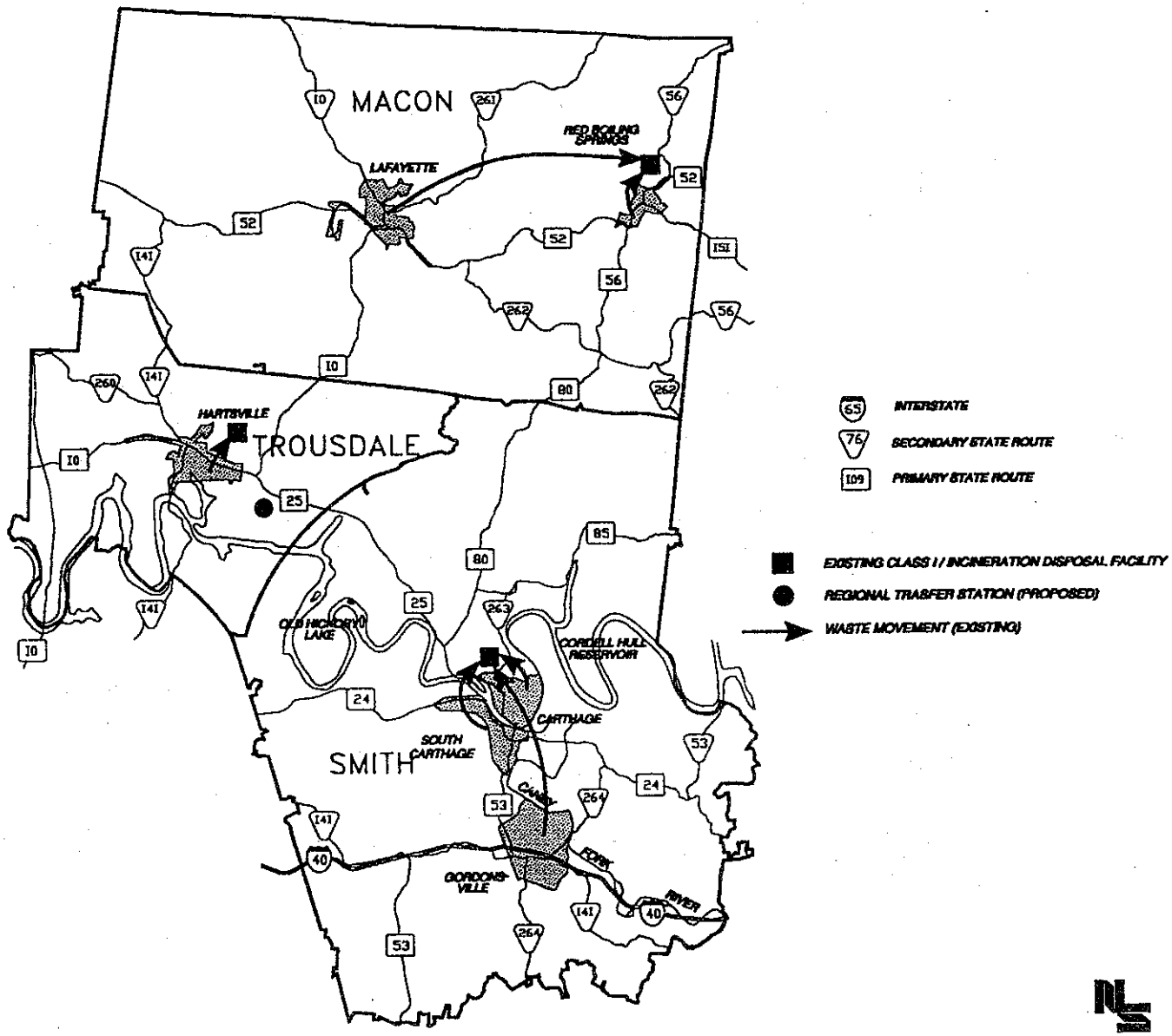


Table V-2
Collection Service by Service Area and Provider

Service Area/ Provider	Households Served	Non-Households Served	Disposal Destination	
			In-County	Other
Macon County				
Public Collection:				
Lafayette, City of	1,585	240	X	
Red Boiling Springs, City of	371	60	X	
Subtotal	*1,956*	*300*		
Private Collection:				
A&J Waste Disposal	100	0	X	
J&A Trash Disposal	340	0	X	
Jimmy Law	0	0	X	
Macon County Waste System	0	0	X	
Macon Trash Disposal	742	0	X	
Subtotal	*1,182*	*0*		
COUNTY TOTAL	3,138	300		
Smith County				
Public Collection:				
Carthage, Town of	743	143	X	
Gordonsville, Town of	347	11	X	
South Carthage, Town of	343	25	X	
Smith County (con. centers)	3,925	0	X	
Subtotal	*5,358*	*179*		
Private Collection:				
Bonnell Co., Inc.	0	1	X	
Waste Management of TN	0	25	X	
Wilson Brothers Disposal	0	8	X	
Subtotal	*0*	*34*		
COUNTY TOTAL	5,358	213		
Trousdale County				
Public Collection:				
Hartsville, Town of	660	130	X	
Trousdale County (con. center)	1,601	0	X	
Subtotal	*2,261*	*130*		
Private Collection:				
Waste Management of TN	0	2	X	
Subtotal	*0*	*2*		
COUNTY TOTAL	2,261	132		
REGION TOTAL	10,757	645		

Source: Department of Environment and Conservation, Tennessee Non-Hazardous Waste Flow Report, May 04, 1993; 1991 Needs Assessments, 1990 Census household data.

MEETING THE COLLECTION NEEDS

Although all areas without public collection have adequate private collection, this must be monitored by Macon County to ensure that adequate collection continues. If service should drop to less than 90% coverage, the county will have to provide other service.

The State of Tennessee requires that a county provide a minimum level of service if there is less than 90% collection coverage provided by the private and public sector. Convenience centers are an acceptable mininum level of service when provided in numbers adequate to serve all residents. The number of convenience centers required is determined by service area in square miles or by population from most recent census data. The service area is the number of square miles in the county minus federal/state lands and reservations, forestry reserves held by wood processing industry, federally managed water bodies or rivers, and municipal corporations served by mandatory collection. The minimum number of centers is determined by dividing the service area square miles by one hundred, eighty (180) square miles. These convenience center regulations are proposed and expected to be approved "as is" this fall.

The determination of minimum number of centers by population is provided by dividing service area population by 12,000. All calculations are to be rounded to the nearest whole number. The following is the minimum number of convenience centers which might be required for Macon County determined by the population of areas not served by the public sector.

	1990 Relevant Population	Determination Factor	Centers Required
Macon County	11,360	12,000	1

At this time, Macon County does not intend to provide public waste collection. However, the county will continue to monitor collection service areas to ensure that county residents are provided with adequate collection service.

MEETING THE TRANSPORTATION NEEDS

Since it has been determined that all existing landfills in the Region will close, it will be necessary for the counties of Macon, Smith, and Trousdale to transport their wastes to a another Class I facility. There are two different options for transporting the waste:

1.) *Direct Haul* - Collection vehicles haul directly from their points of waste collection to the Class I facility; and

2.) *Transfer Station Development* - Collection vehicles haul to a transfer station from their points of waste collection. The waste is transferred to large containers which are then hauled to the Class I facility when full.

The comparison of these two options is discussed below. Since the collection costs of driving between customers will remain the same for both options, these costs are not taken into account in the evaluation.

Direct Haul

The estimated cost of direct hauling for each county should be calculated at approximately $0.25/ton-mile cost for compaction vehicles. Trucks with a smaller load capability will cost more per ton-mile. In addition, other factors must be taken into account as well such as the need for additional trucks and labor. The actual direct haul cost will depend upon the ultimate disposal destination chosen.

Transfer Station Development

There are two transfer station options which the three counties have chosen to look at: 1.) a transfer station to provide for all three counties to haul the waste out-of-region for disposal; and 2.) a transfer station to provide for Macon and Trousdale Counties to haul their waste out-of-region if Smith County determines to build their own landfill. It was further determined that the transfer stations should be designed to be efficient but as low-cost as possible. Tipping floor and direct-dump type transfer stations were evaluated; the Region determined that a direct-dump transfer station was desirable for this project.

Table V-3 provides the estimated costs of a direct-dump transfer station for the three counties and for just Macon and Trousdale Counties. The total cost per ton would be $2.45 for a direct-dump transfer station for the three counties and $2.97 per ton for a direct-dump transfer station just for Macon and Trousdale Counties. These costs do not include transportation costs from various points of collection to the transfer station. They also do not include transportation costs from the transfer station to the out-of-region Class I landfill or the costs of disposal at that landfill.

Table V-3
Public Transfer Station
Construction & Operating Costs

Participating Counties	Cost Per Ton
Macon, Smith and Trousdale	$ 2.45
Macon and Trousdale	$ 2.97

INTEGRATION OF OTHER MATERIAL COLLECTION

Trousdale County may utilize the transfer station property to provide a drop-off collection facility for problem wastes since the chosen transfer station site is in Trousdale County. However, this will be determined in the future dependent upon the adequacy of problem waste collection sites developed prior to transfer station development. Other counties must provide collection sites within their own counties by State law. However, the Region would like the State law to provide that Region's may combine efforts for the provision of problem waste collection and management.

STAFFING AND TRAINING

The transfer station will require a trained attendant to operate the facility. The attendant will be on duty during all operational hours. Initial training will be conducted by the designer of the transfer station. Training thereafter will be conducted by Region/county personnel.

COLLECTION AND TRANSPORTATION BUDGET

The following Table V-4 provides the collection and transportation budget for the next ten (10) years. This includes the waste collection costs and proposed transfer station and transportation costs.

Table V-4
Collection and Transportation Budget
by Fiscal Year

	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003
Revenues:										
General Fund Allocations	345,905	325,112	489,309	506,682	524,672	543,302	562,595	582,574	603,265	624,691
User Fees	169,602	208,438	239,915	248,433	257,254	266,388	275,848	285,644	295,788	306,294
Convenience Center Grants	0	100,000	0	0	0	0	0	0	0	0
Total Revenues	**$515,507**	**$633,550**	**$729,224**	**$755,114**	**$781,926**	**$809,691**	**$838,443**	**$868,218**	**$899,053**	**$930,985**
Expenditures:										
Collection	515,507	633,550	655,724	678,674	702,428	727,013	752,458	778,794	806,052	834,264
Regional Transfer Station	0	0	73,500	76,440	79,498	82,678	85,985	89,424	93,001	96,721
Total Expenditures	**$515,507**	**$633,550**	**$729,224**	**$755,114**	**$781,926**	**$809,691**	**$838,443**	**$868,218**	**$899,053**	**$930,985**
Net Revenue/Expenditure	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Note 1.) Fiscal Year 1993-1994 based upon actual fiscal year 1992-1993 information collected.
Note 2.) Inflation estimated at 3.5% annually.
Note 3.) The *General Fund* revenue calculated to cover costs not covered by other revenue sources
Note 4.) The *User Fee* revenue was calculated to cover 32.9% of costs as reported in 1992-1993 accounts.
Note 5.) The *Convenience Center Grants* revenue is a $50,000/county grant available to counties with a convenience center collection system or some higher form of collection. Smith County and Trousdale County will apply for this grant.
Note 6.) The *Collection* expense represents the cost for door-to-door collection and convenience center collection costs reported by each municipality and county and increased for inflation each year. Convenience centers will be upgraded in fiscal year 1995 with State grant funds.
Note 7.) The *Regional Transfer Station* expense represents the cost to develop and operate one regional transfer station.

IMPLEMENTATION SCHEDULE

The following Table V-5 provides the implementation schedule for developing the transfer station. This project must be completed by September 1996 as all Region landfills will be closed by October 1996. The Hartsville Landfill in Trousdale County will close by October 1994 or sooner. The Red Boiling Springs Landfill in Macon County and the Smith County Landfill will close by October 1996. Trousdale County must contract for disposal once the Hartsville Landfill closes and until the transfer station is operational. The site of the transfer station will be in Trousdale County. Appendix D provides the approval letter for utlizing a Tennessee Valley Authority site.

Table V-5
Collection and Transportation Implementation Schedule

		1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1999-
		Quarters	Quarters	Quarters	Quarters	Quarters	2003
1	Acquire Property for Transfer Station						
2	Design Transfer Station and Acquire Permit-by-Rule						
3	Contract for Transfer Station Construction & Operation						
4	Construct Transfer Stations						
5	Operate Transfer Station						
6	All Municipalities Provide for Collection of Solid Waste						
7	All Counties Provide or Insure Collection of Solid Waste						
8	Smith County Applies for State Convenience Center Grants (Upgrade)						
9	Trousdale County Applies for State Convenience Center Grants (Upgrade)						
10	Smith County Upgrades Existing Convenience Centers w/Grant						
11	Trousdale County Upgrades Existing Convenience Centers w/Grant						
12	Provide Annual Regional Collection Reports to the State						

Five-Year Milestone Achievements	*Date*
Transfer Station Begins Operation	10/01/96
Smith County Upgrades Convenience Center System	10/01/95
Trousdale County Upgrades Convenience Center System	10/01/95

RESPONSIBLE ENTITIES WITHIN THE REGION

The waste collection and transportation responsibility will remain with each individual county. The disposal system will be a regional effort for Macon, Smith, and Trousdale Counties. Since it is mandated by law that each county provide for the collection of recyclables and problem wastes, this responsibility will also remain with the individual counties. However, the marketing of materials will be handled on a regional basis to take advantage of economies of scale.

SUMMARY OF EXISTING AND PROPOSED SYSTEM

Map 5 provides the location of all existing and proposed elements of the Region's collection and transportation system. This includes the flow of the current waste stream to management and disposal destinations.

CHAPTER 6

RECYCLING

REGIONAL NEEDS FOR RECYCLING SYSTEM

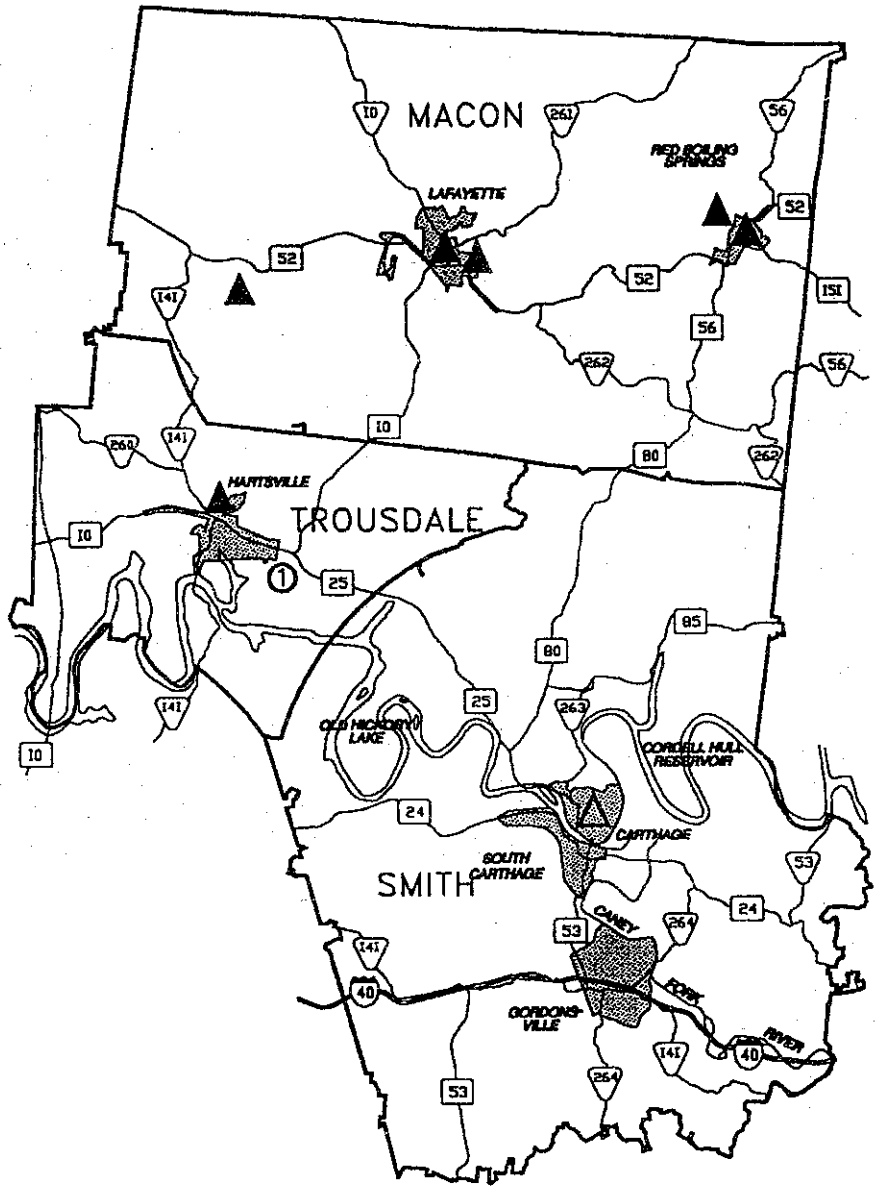
The North Central Planning Region (NCPR) has several public recycling programs currently operating. In addition, there are several commercial, institutional, and industrial entities who have implemented some recycling. The public and private programs were briefly described in Chapter 2; non-residential recycling survey results are provided Table I-11 in Chapter 1. The following Table V-1 provides the existing recycling programs as well as quantities recycled in fiscal year 1993. Map 5 provides the location of existing recycling programs.

Table VI-1
Recycling Programs
and Quantities Recycled
Fiscal Year 1993

Program	Tons Recycled
Macon County:	
Macon County	3
City of Lafayette	280
Private Non-Residential Programs	1,564
COUNTY TOTAL	*1,847*
Smith County:	
Private Non-Residential Programs	390
COUNTY TOTAL	*390*
Trousdale County:	
Trousdale County/Hartsville	206
Private Non-Residential Programs	370
COUNTY TOTAL	*576*
REGION TOTAL	2,813

Sources: Interviews with counties/municipalities, April & July 1993;
Non-residential survey, June 1993 (see Table I-11).

Recycling Programs
North Central Planning Region



INTERSTATE

SECONDARY STATE ROUTE

PRIMARY STATE ROUTE

RECYCLING COLLECTION CENTER (EXISTING)

RECYCLING COLLECTION CENTER (PROPOSED)

RECYCLING PROCESSING FACILITIES

① RECYCLING SERVICES INSTITUTE

Although recycling efforts are occuring in all of the counties, the Region would like to continue and expand in its recycling efforts to increase waste reduction. The existing programs are very local in nature with separate coordinators, program design, and marketing. Regional cooperation will expand the existing programs and allow for shared expenses of mutual program components such as transportation and marketing efforts.

Smith County has not implemented a recycling program but intends to provide a recycling drop-off program by January 1, 1996.

Once a drop-off program is implemented in Smith County, there will be a recycling opportunity for all residents and businesses in the Region. It will be up to the counties and Region to monitor the programs to ensure that they are meeting the needs of the users; for example, some businesses may wish to drop off their cardboard as it is not feasible for them to recycle small quantities themselves. It will also be critical to continually provide information so residents know about the program and how to participate. Chapter 9 discusses an information and education program which should include dispersing recycling program information.

GOALS AND STRATEGIES

The NCPR's goal is to increase waste reduction as much as economically and practically feasible. The Region has adopted a goal of 25% for recycling which combined with other waste reduction efforts exceeds the 25% waste reduction goal by December 31, 1995. The current recycling effort accounts for 2,813 tons per year or 9.73%.

The current system of each county providing systems for collection of recyclables will be maintained. This is to provide greater local input, community involvement, and to meet the State's requirement that each county provide at least one collection site for recyclables by January 1, 1996.

However, the NCPR will coordinate the programs to ensure that quantities and quality provide the greatest revenue return. It will be necessary to provide regional oversight of the programs to determine what materials should be collected (tempered with local needs and desires); how they should be processed; and where the materials can be marketed for the best return.

There is currently one facility in the Region which could provide for the processing and cooperative marketing of the Region's recyclable materials: Recycling Services Institute (RSI) in Trousdale County. It is anticipated that this facility will be utilized by the Region. In the past the RSI facility has presented problems for Region counties utilizing the facility as the facility closed without notice for several months before reopening. A recent restructuring of the facility's management methods should provide more consistent service.

Another option for the NCPR would be to build and operate their own materials recovery facility (MRF). Utilizing cost data from the Governmental Advisory Associates, Inc. publication *Materials Recovery & Recycling Yearbook, 1992-1993*, a cost estimate for developing a MRF for the Macon, Smith, and Trousdale Counties is $1.5 million for construction and $478,421 a year for operation and maintenance. This provides an annual cost of $692,021 or $80 per ton if financed at 7% over 10 years. This is assuming that the facility will be low-technology and collect 30% of the total waste generation. The cost estimate does not include revenues from material sales, tipping fees or landfill avoidance cost; however, this cost is still prohibitive. Costs could be cut by utilizing volunteers, State grants for equipment, and other in-kind contributions. This option will only be considered if the situation changes in the future and if other counties might consider utilizing the facility.

COORDINATION OF PUBLIC AND PRIVATE EFFORTS

The NCPR will encourage recycling through its education program. This program will target households, schools, business, industry, the media, and government officials. The program will include the need to purchase recycled products to increase the marketability of recyclable materials. Efforts will include coordination with the Office of Cooperative Marketing and the University of Tennessee to assist business and industry in determining how they can participate and market their materials to reduce waste disposal costs and become positively involved in the community.

Some existing programs already include coordination with the private sector by accepting materials from business. This will be expanded by encouraging cooperation by the private sector in participation with existing programs or developing their own programs.

Efforts will be made to work with existing recycling businesses so that there is not a duplication of effort or that public efforts should damage existing private efforts.

IMPLEMENTATION SCHEDULE AND BUDGET

A regional coordinator will provide oversight of the programs to ensure that they are efficient and provide adequate service; the coordinator will also handle solid waste education. It is not known at this time if this will require a new position or the expansion of an existing position.

Annual reports will be provided to the State to reflect the efforts of the recycling programs. The regional coordinator will be responsible for maintaining records of all marketing of recyclables. Each program will be responsible for maintaining records to be provided to the regional coordinator for his/her compilation and reporting to the State.

Table VI-2 provides the implementation schedule for the recycling programs. Table VI-3 provides the budget for 10 years.

Table VI-2
Recycling
Implementation Schedule

		1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1999-
		Quarters	Quarters	Quarters	Quarters	Quarters	2003
1	Establish Annual Goals and Objectives						
2	Develop Recycling Measurement and State Reporting Method						
3	Provide Annual Regional Recycling Report to the State						
4	Provide Recycling Programs Information to the Public						
5	Work with Schools to Develop In-School Programs						
6	Evaluate Regional Strategy for Marketing Materials						
7	Evaluate Funding Sources Including State Grants						
8	Evaluate Hiring Regional Recycling Coordinator						
9	Macon County Provides Drop-Off System						
10	Smith County Provides Convenience Center Drop-Off System						
11	Trousdale County Provides Convenience Center Drop-Off System						
12	Provide Transfer Station Drop-Off System						
13	Programs Apply for State Recycling Equipment Grants						

Five-Year Milestone Achievements	*Date*
Smith County Develops Recycling Drop-Off System	July 30, 1994
Provide Transfer Station Drop-Off System	July 30, 1994

Table VI-3
Recycling Program Budget
by Fiscal Year

Activity	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003
Revenues:										
General Fund	$15,769	$18,484	$18,111	$31,038	$43,816	$45,350	$46,937	$48,580	$50,280	$52,040
User Fees	7,732	9,063	18,932	22,827	21,746	22,507	23,295	24,110	24,954	25,828
Sale of Materials	0	0	500	518	536	554	574	594	615	636
Recycling Equipment Grants	0	0	20,000	15,000	0	0	0	0	0	0
Total Revenues	**$23,500**	**$27,548**	**$57,543**	**$69,382**	**$66,098**	**$68,411**	**$70,806**	**$73,284**	**$75,849**	**$78,504**
Expenditures:										
Smith County Drop-Off	$0	$0	$15,000	$15,350	$10,175	$10,531	$10,900	$11,281	$11,676	$12,085
Trousdale County Drop-Off	15,000	18,750	28,438	34,433	35,638	36,885	38,176	39,512	40,895	42,327
Macon County Drop-Off	8,500	8,798	14,105	19,599	20,285	20,995	21,730	22,490	23,278	24,092
Total Expenditures	**$23,500**	**$27,548**	**$57,543**	**$69,382**	**$66,098**	**$68,411**	**$70,806**	**$73,284**	**$75,849**	**$78,504**
Net Expense/Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Note 1.) Fiscal Year 1993-1994 based upon actual fiscal year 1992-1993 information provided by each County.
Note 2.) Inflation was calculated at 3.5% annually.
Note 3.) The *General Fund* revenue was calculated to cover costs not covered by other revenue sources.
Note 4.) The *User Fee* revenue was calculated to cover 32.9% of costs as reported in the 1992-1993 accounts.
Note 5.) The *Recyclables Sales* revenue is negligible as the Macon and Trousdale County programs do not report any revenue.
Note 6.) The *Recycling Equipment Grants* revenue represents State grants to purchase recycling collection and processing equipment. Smith County will apply for $10,000 in FY 1996, and Macon and Trousdale will apply for $5,000 each. In the following FY 1997, each county will apply for $5,000.

RESPONSIBLE ENTITIES WITHIN THE REGION

Each county will be responsible for the collection of recyclables. A regional coordinator will be responsible for coordinating efforts of the various programs and assisting with marketing the materials.

SUMMARY OF EXISTING AND PROPOSED SYSTEM

Map 5 provides the location of all existing recycling programs, private buy-back centers and processing facilities. It also includes the proposed Smith County drop-off facility. A coordinated effort by the Region counties is anticipated to provide for greater recycling opportunities in the Region and greater waste reduction.

CHAPTER 7

COMPOSTING, SOLID WASTE PROCESSING, WASTE-TO-ENERGY, AND INCINERATION CAPACITY

GOALS AND STRATEGIES

Composting

There may be yard waste composting programs implemented within the Region in the future. However, these have been undetermined. At the present time it is estimated that a regional yard waste composting program for the Region would cost an estimated $30 per ton. The yard waste tonnage was estimated to be 17% of the waste stream; this may be a high estimate due to a probability of low participation because of the rural setting of the three counties. A lower yard waste stream than the estimated 17% would increase the cost per ton for this program. It is important to note that yard waste composting may become more feasible if located with another facility to coordinate labor and equipment resources. Some counties and municipalities may at some point also determine to develop a very low-technology operation for a pilot program.

Processing

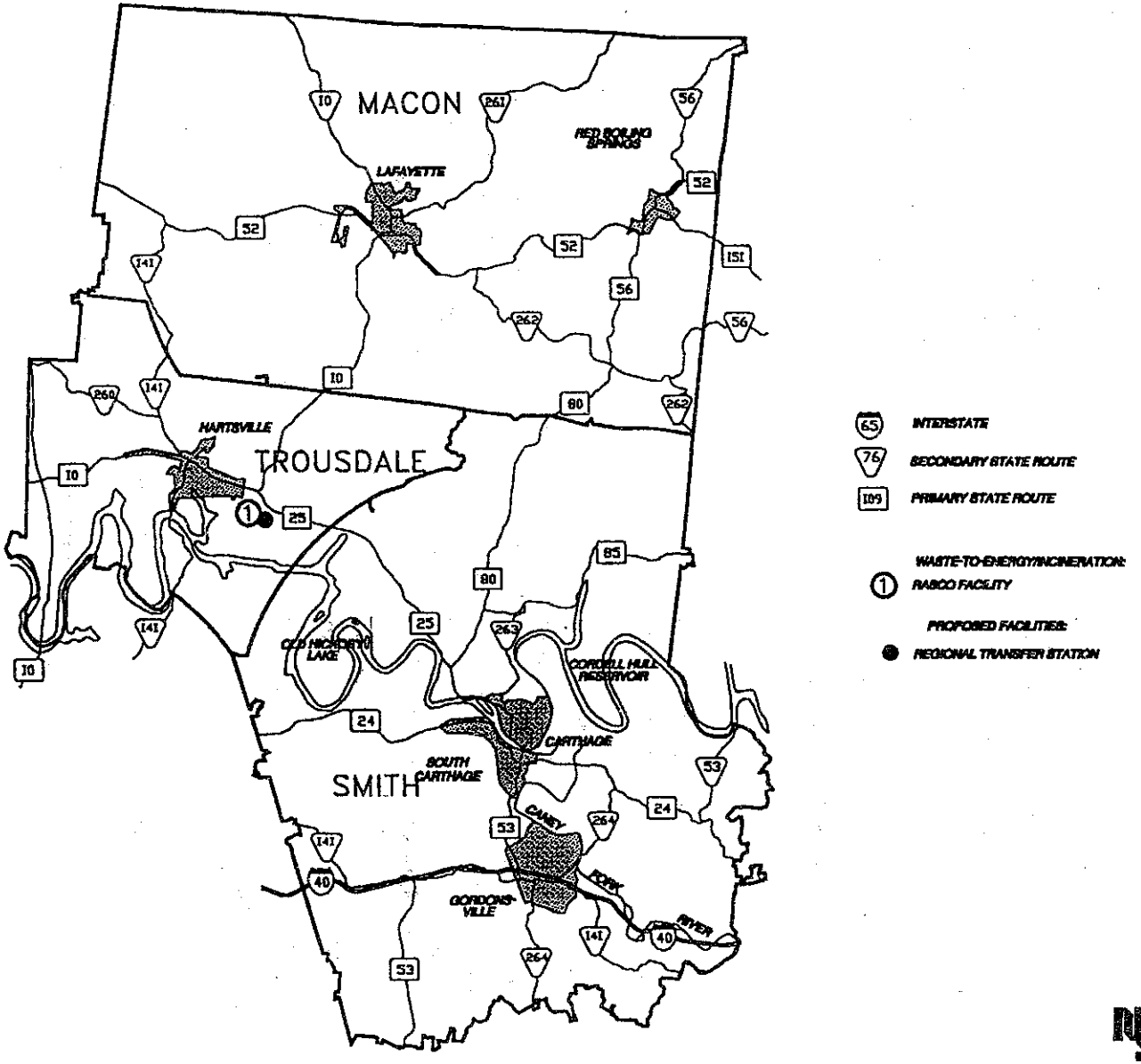
There is currently one (1) processing facility in the Region: the Recycling Services Institute (RSI) in Trousdale County.

There are no other anticipated changes in the current composting, processing, and incineration programs. Any proposed changes in the future are to be reviewed by the host county and the Region board to ensure that new or expanded facilities do not deviate from the intent of the plan.

MAP 6

Compost, Processing and Waste-to-Energy Facilities

North Central Planning Region



CHAPTER 8

DISPOSAL CAPACITY

CLASS I DISPOSAL CAPACITY NEEDS

There will be a total estimated Class I landfill disposal capacity of 59,900 tons in the Region after October 9, 1993. This will consist of 22,000 tons capacity at the Red Boiling Springs Landfill in Macon County which will close by October 1996, 32,100 tons capacity at the Smith County Landfill which will also close by October 1996, and 5,800 tons capacity at the Hartsville/Trousdale County Landfill which will close by October 1994 or sooner. Map 8 provides the location of existing Class I landfills in the Region.

The following Table VIII-1 provides the annual Class I disposal requirements from 1993 - 2003, available anticipated capacity within each county and the Region, the capacity to be provided other than from currently used facilities, and the surplus or shortfall of capacity.

As discussed in previous chapters, Smith County is currently evaluating the possibility of developing its own landfill to meet the new regulations. Although Smith County is working with Macon and Trousdale Counties on the development of a jointly utilized transfer station, Smith County retains the option to withdraw from this venture and work toward county landfill development if deemed feasible. The NCPR counties are in agreement that Smith County will make a final determination within eighteen (18) months from October 1993. If Smith County determines to develop a landfill, this plan will be amended to reflect this change and state if Macon and Trousdale Counties intend to continue with the transfer station option with just two counties.

CLASS IV DISPOSAL CAPACITY NEEDS

As mentioned previously, Smith County is currently awaiting permitting approval for a Class IV landfill. It is planned that this facility be operational by December, 1994. It will provide services to the three-county region, where no other Class IV facilities exist.

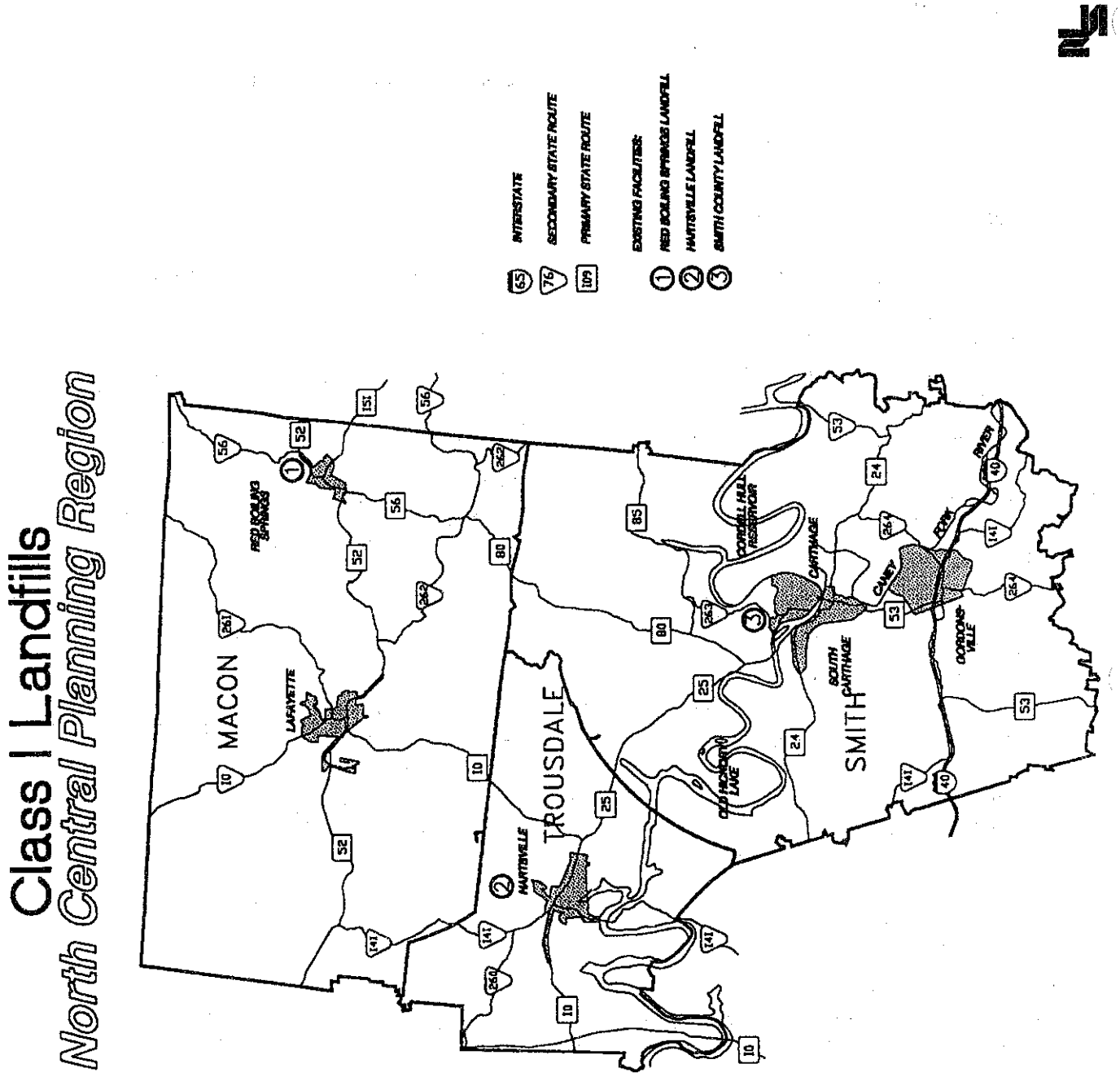

MRP 7
Class I Landfills
North Central Planning Region
INTERSTATE
SECONDARY STATE ROUTE
PRIMARY STATE ROUTE
EXISTING FACILITIES:
1 RED BOILING SPRINGS LANDFILL
2 HARTSVILLE LANDFILL
3 SMITH COUNTY LANDFILL
MACON
TROUSDALE
SMITH
LAFAYETTE
HARTSVILLE
CARTHAGE
CAMEY
SOUTH CARTHAGE
GORDONSVILLE
CORDELL HULL RESERVOIR
OLD HICKORY LAKE
RIVER
FORK

Table VIII-1
Projected Class I Capacity
Tons Per Year

Macon County				
Year	Capacity Needed	Available Capacity in County	Other Capacity to be Provided	Surplus (+)/ Shortfall (-)
1993	7,508	7,508	0	0
1994	7,590	7,590	0	0
1995	7,610	7,610	0	0
1996	10,559	4,936	5,623	0
1997	10,631	0	10,631	0
1998	10,971	0	10,971	0
1999	10,614	0	10,614	0
2000	10,954	0	10,954	0
2001	11,305	0	11,305	0
2002	11,666	0	11,666	0
2003	12,040	0	12,040	0

Note: Starting 1996 unmanaged waste included in Class I disposal needs.

Smith County				
Year	Capacity Needed	Available Capacity in County	Other Capacity to be Provided	Surplus (+)/ Shortfall (-)
1993	10,568	10,568	0	0
1994	10,622	10,622	0	0
1995	10,616	10,616	0	0
1996	10,955	8,216	2,739	0
1997	11,060	0	11,060	0
1998	11,414	0	11,414	0
1999	11,518	0	11,518	0
2000	11,886	0	11,886	0
2001	12,266	0	12,266	0
2002	12,659	0	12,659	0
2003	13,064	0	13,064	0

Trousdale County				
Year	Capacity Needed	Available Capacity in County	Other Capacity to be Provided	Surplus (+)/ Shortfall (-)
1993	5,729	5,729	0	0
1994	5,783	4,337	1,446	0
1995	5,836	0	5,836	0
1996	5,817	0	5,817	0
1997	6,003	0	6,003	0
1998	6,195	0	6,195	0
1999	6,018	0	6,018	0
2000	6,210	0	6,210	0
2001	6,409	0	6,409	0
2002	6,614	0	6,614	0
2003	6,826	0	6,826	0

North Central Region				
Year	Capacity Needed	Available Capacity in Region	Other Capacity to be Provided	Surplus (+)/ Shortfall (-)
1993	23,805	23,805	0	0
1994	23,995	22,549	1,446	0
1995	24,062	18,226	5,836	0
1996	27,331	13,152	14,179	0
1997	27,694	0	27,694	0
1998	28,580	0	28,580	0
1999	28,150	0	28,150	0
2000	29,050	0	29,050	0
2001	29,980	0	29,980	0
2002	30,939	0	30,939	0
2003	31,930	0	31,930	0

CLASS I LANDFILL DISPOSAL

The closure of all existing Class I landfills in the Region necessitates the development of new disposal alternatives. The counties of Macon, Smith, and Trousdale have evaluated three disposal options: 1.) developing individual county Class I landfills for individual needs; 2.) developing a three-county regional Class I landfill; and 3.) contracting for disposal at a private/public Class I landfill outside the Region.

Table VIII-2 summarizes the cost per ton for the development of county landfills for county use and a three-county regional landfill. Table VIII-3 provides the cost per ton provided by contractors in preliminary proposals requested by the Region in July 1993.

Table VIII-2
Class I Landfill Development Alternatives
Cost Per Ton

Macon County Landfill	Smith County Landfill	Trousdale County Landfill	Regional Landfill (3-county)
$68	$77	$103	$41

Table VIII-3
Contract for Disposal Alternatives
Cost Per Ton

	Middlepoint Landfill (Rutherford County)	H&W Environmental Services (Benton County)	Quail Hollow or Cedar Ridge Landfill (Bedford or Marshall County)	Clay County Landfill
Disposal Fee	$28	$32 - 36	$25	$32
Haul Fee	not provided	$10 - 16	$13	not provided

IMPLEMENTATION SCHEDULE

All of the existing Class I landfills in the Region will close prior to 1996. Macon, Smith, and Trousdale Counties will develop a transfer station to operate once all landfills have closed and contract for disposal out-of-region. Smith County is considering the possibility of developing a new Class I landfill in Smith County for its own use. However, at this time the county will work with Macon and Trousdale Counties toward development of a transfer station and contracting for disposal. Table VIII-4 provides the implementation schedule to provide for disposal in the three counties. Chapter 4 provides a more detailed schedule for developing the transfer station.

Table VIII-4
Disposal Capacity Provision
Implementation Schedule

		1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1999-
		Quarters	Quarters	Quarters	Quarters	Quarters	2003
1	Trousdale County Class I Landfill Closes						
2	Trousdale County Contracts for Class I Landfill Disposal						
3	Macon County Class I Landfill Closes						
4	Smith County Class I Landfill Closes						
5	Region Contracts for Class I Disposal for Transfer Station Waste						
6	Smith County Class IV Landfill Operates						
7	Report Regional Class I Disposal to State Annually						
8	Report Regional Class IV Disposal to State Annually						

Milestone Achievements	*Date*
Trousdale County Landfill Closes	Oct 1, 1994
Macon County Landfill Closes	Oct 1, 1996
Smith County Landfill Closes	Oct 1, 1996
Smith County Class IV Landfill Begins Operations	Jan 1, 1995

10-YEAR BUDGET

The budget for the provision of landfill capacity is provided in the following Table VIII-5. Chapter 5 provides the budget for the transfer station development and haul to the landfill.

Table VIII-5
Disposal Capacity Provision Budget
by Fiscal Year

Activity	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003
Revenues:										
General Fund	$183,538	$325,575	$239,483	$669,326	$532,046	$601,049	$586,972	$583,688	$648,941	$641,380
User Fees	205,111	272,234	258,040	404,140	314,956	358,346	361,847	365,279	402,661	404,710
Tipping Fees - Class I	234,789	192,870	199,621	51,652	0	0	0	0	0	0
Tipping Fees - Class IV	0	36,780	87,173	103,271	110,312	129,802	151,020	161,303	172,292	184,031
Total Revenues	**$623,437**	**$827,459**	**$784,318**	**$1,228,390**	**$957,315**	**$1,089,197**	**$1,099,840**	**$1,110,269**	**$1,223,894**	**$1,230,121**
Expenditures:										
Class I Operation	$623,437	$529,431	$508,001	$131,445	$0	$0	$0	$0	$0	$0
Class I Closure and Post-Closure	0	130,526	11,265	361,858	43,703	34,522	34,875	35,242	35,624	36,035
Contract for Out of County Disposal-Class I	0	129,645	186,445	650,475	822,535	956,640	959,440	961,440	1,066,005	1,064,655
Class IV Disposal Facility	0	37,858	78,607	84,613	91,077	98,035	105,525	113,588	122,266	129,431
Total Expenditures	**$623,437**	**$827,459**	**$784,318**	**$1,228,390**	**$957,315**	**$1,089,197**	**$1,099,840**	**$1,110,269**	**$1,223,894**	**$1,230,121**
Net Revenue/Expenditure	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Note 1.) Fiscal year 1993-1994 is based upon actual fiscal year 1992-1993 information collected.
Note 2.) The inflation rate is calculated at 3.5% annually.
Note 3.) The *General Fund* revenue was calculated to cover costs not covered by other revenue sources.
Note 4.) The *User Fee* revenue was calculated to cover 32.9% of costs as reported in 1992-1993 accounts.
Note 5.) The *Tipping Fees-Class I* revenue is based upon reported 1992-1993 revenue and closure dates of existing landfills.
Note 6.) The *Tipping Fees-Class IV* revenue is based upon Smith County estimates.
Note 7.) The *Class I Operation* expenditure is based upon reported 1992-1993 actual expenditures. It also reflects the closure of the Hartsville/Trousdale County Landfill in October 1994 and the closure of the Macon and Smith County Landfills in October 1996.
Note 8.) The *Class I Closure and Post-Closure* expenditure is based on the Landfill Closure/Post-Closure Plan: Macon County Landfill, Neel-Schaffer, Inc., March 1994; the Closure/Post-Closure Plan for the Smith County Landfill, Crouch Engineering, P.C., August 1992; and the *Hartsville/Trousdale County Closure/Post-Closure Plan*, Barge, Waggoner, Sumner and Cannon, September 1992.
Note 9.) The *Contract for Out of County Disposal-Class I* expenditure reflects a contract for disposal as the county/city landfills close.
Note 10.) The *Class IV Disposal Facility* expenditure reflects the development and operation of the proposed Smith County Class IV Disposal Facility. This financial information was supplied by the Smith County Engineer Ricky White.

RESPONSIBLE ENTITIES WITHIN THE REGION

The transfer station will be shared by Macon, Smith, and Trousdale Counties. In addition, the three counties will contract for haul and disposal. The three counties will execute an interlocal agreement to pay for the construction and operation of the transfer station and the cost for hauling and disposal.

SUMMARY OF EXISTING AND PROPOSED SYSTEM

As the existing Class I landfills will close prior to October 1996 as discussed above, the three counties of Macon, Smith, and Trousdale must provide some other disposal destination. A transfer station will be developed for the counties where a private hauler will be contracted to transport the waste to a landfill out of the Region. Although this is currently the intended plan for the provision of disposal capacity, Smith County would like to continue looking at the possibility of developing a landfill in Smith County for its own use.

CHAPTER 9

PUBLIC INFORMATION AND EDUCATION

PUBLIC INFORMATION AND EDUCATION PROGRAM NEEDS

There are currently very few solid waste informational or educational programs existing in the Region and their audiences are limited. Although the State provided each school with an environmental curriculum, "Frog Pond," it is not being fully utilized. However, the State is developing a new strategy for educating children about the importance of the environment and solid waste management to be implemented during the fall of 1993. The North Central Planning Region (NCPR) will work in any way possible in conjunction with this program.

In addition, the NCPR will provide public information and educational opportunities for resident adults and businesses. There is currently very little education available for adults in the Region. However, Smith County has a CLEAN Tennessee program.

Because the public is becoming increasingly aware of the dangers of environmental contamination from mismanaged solid waste, incomplete understanding of the responsibility for sound solid waste management can lead to misguided concerns. For instance, residents may oppose the construction of a solid waste facility because of perceived environmental threats, although the facility is being built specifically to reduce those threats. An effective educational program must first inform the public that the days of careless waste-- and the dumps they spawned--must end. The next step is to instill in the public a sense of responsibility for sound waste management.

In counties where illegal dumping is rampant, it is particularly important for the public to understand the dangers of mismanagement and the benefits of proper management of solid waste. The goal is to not only reduce the threat of environmental damage, but reduce disposal of materials by recycling. Waste materials are often products with potential uses, and only those wastes that cannot be reused or recycled should be discarded. For a long-range plan to be effective, this concept must apply to homes, work places and the entire public and private collection and disposal process.

GOALS AND STRATEGIES

NCPR has established the goal that all of its residents shall have the opportunity to learn more about responsible solid waste management. This goal can only be achieved through coordination with existing government and interest groups to disseminate the information effectively.
Key steps necessary to provide a comprehensive solid waste management education program include:

1. *Education of local officials*
   - Information and educational materials should be developed to instruct local officials about responsible solid waste management;
   - Public educational materials should be provided to local governments for education of public employees and private citizens; and
   - Development of government office waste reduction programs to set an example to the community and gain experience in education, source reduction and recycling.

2. *Education of local interest groups*
   - Local interest groups including the media should be targeted to assist in a solid waste educational program;
   - Informed environmental groups could be used as resources; and
   - Interest groups with relevant activities could be educated as to how they might fit into a solid waste education program, e.g. a garden club might become involved in a backyard composting program or a home economics organization might test non-toxic household cleaners.

3. *Coordination with existing solid waste education groups*
   - Coordinate with the University of Tennessee Center for Industrial Services and encourage business and industry to participate in the waste reduction program;
   - Explore the Keep America Beautiful programs for potential local participation programs;
   - Coordinate with the County Extension offices which distribute educational materials; and
   - Work with the Tennessee Office of Cooperative Marketing.

4. *Education of the General Public*
   - Educate the public through public speaking, workshops, television, radio and other types of communication; and
   - Focus on the cost and environmental impact of mismanaged solid waste and how it affects the community.

The NCPR will provide public information regarding all solid waste management and waste reduction opportunities throughout the Region. This information will be disseminated by the public education coordinators by newspaper, radio, volunteers going door-to-door and public speaking engagements.

Public education will be provided to educate residents about all aspects of solid waste management but focusing upon waste reduction. This component of the plan may be the most important as all residents generate waste and must manage it in their homes and businesses. But many are not informed about the need for better managing of that waste both at the source and beyond.

The coordinators will provide comprehensive public information about existing programs and solid waste management education. The coordinators will work with local interest groups, schools, State agencies, the University of Tennessee, and the county extension offices to develop educational programs. The coordinators will work with volunteers from these organizations to provide public engagements to provide educational materials to the public.

IMPLEMENTATION SCHEDULE

It is currently not known what costs this program will incur. This will be dependent upon the coordination of resources with other programs. However, the litter grant education program will provide $11,679 to Macon and Smith County or $0.085 per person; and $1,010 to Trousdale County or $0.17 per person during the 1994 fiscal year. This would provide funds for salary, benefits, advertising, and publishing.

The following is an implementation schedule for the education and information program which will begin November 1994 and be continued indefinitely.

Table IX-1
Public Education Program
Implementation Schedule

		1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1999-
		Quarters	Quarters	Quarters	Quarters	Quarters	2003
1	Establish Annual Goals and Objectives						
2	Provide Education Programs Information to the Public						
3	Develop Method to Measure Education Accomplishments						
4	Inventory Existing Education Programs/Resources						
5	Evaluate Schools' Waste Management Curriculum						
6	Evaluate Funding Sources Including State Grants						
7	Prepare to Apply for Grants/Loans						
8	Establish Network with Education Organizations/Agencies						
9	Establish Network with Solid Waste Experts						
10	Work with Local Education Programs for Expansion of Service						
11	Develop Education Strategies for Various Target Audiences						
12	Provide Solid Waste Management Workshops						
13	Provide Speaker's Bureau for Public/Private Organizations						
14	Educate Non-Residential Sectors to Reduce Waste						
15	Work with Schools to Develop Special In-School Programs						
16	Work with Local Governments to Develop Office Programs						

Five-Year Milestone Achievements	*Date*
Continue Education Programs & Include New Solid Waste Programs	Aug 1, 1994

Table IX-2
Education Program Budget
by Fiscal Year

Activity	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003
Revenues:										
State Education Grants	$0	$22,500	$0	$0	$0	$0	$0	$0	$0	$0
State Litter Education Grants	4,145	7,228	10,311	10,311	10,311	10,311	10,311	10,311	10,311	10,311
Total Revenues	**$4,145**	**$29,728**	**$10,311**	**$10,311**	**$10,311**	**$10,311**	**$10,311**	**$10,311**	**$10,311**	**$10,311**
Expenditures:										
Printing & Advertising	$4,145	$10,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000
Public Workshops	0	10,000	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Salaries & Benefits	0	9,728	3,811	3,811	3,811	3,811	3,811	3,811	3,811	3,811
Total Expenditures	**$4,145**	**$29,728**	**$10,311**	**$10,311**	**$10,311**	**$10,311**	**$10,311**	**$10,311**	**$10,311**	**$10,311**
Net Expense/Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

RESPONSIBLE ENTITIES WITHIN THE REGION

Macon and Smith Counties will combine efforts and provide a regional coordinator. Trousdale County has had a very successful education/litter campaign and will continue to be responsible for the education in its county. The counties will provide necessary office space and office materials as necessary. It is anticipated that three counties will utilize the sae person to coordinate their education/litter campaign.

SUMMARY OF EXISTING AND PROPOSED SYSTEM

The existing programs are very limited in most of the counties. Since a portion of the Highway Department Litter Grant funds must be appropriated to education, the counties anticipate being able to provide for an expanded campaign. A regional program coordinator will develop and implement a program to encompass Macon, Smith and Trousdale Counties.

CHAPTER 10

PROBLEM WASTES

The Tennessee Solid Waste Management Act of 1991 requires that every county provide for the management of three problem wastes: tires, lead-acid batteries, and automotive fluids. Landfills will no longer be allowed to accept unshredded tires, lead-acid batteries or automotive fluids as of January 1, 1995. By this date, each county must provide directly or by contact at least one collection site for these materials if adequate sites are not already available in the county.

HOUSEHOLD HAZARDOUS WASTE

The Tennessee Solid Waste Management of Act of 1991 provided that the State would develop a household hazardous waste management program. The State of Tennessee will provide a mobile unit to collect household hazardous waste from each county. It is anticipated that the unit may attend each county once per year at least during these beginning months of the program. The State will provide all necessary components of the collection with the following exceptions: the County must provide a site with pavement, lighting, electricity, and potable water; advertise the upcoming collection day(s) and materials to be accepted; and provide at least one person to assist with the program. The State will then handle management of the materials. The most urban counties and cities are required to develop permanent collection programs. However, none of the counties or cities in the North Central Planning Region (NCPR) fall within this category.

Existing Management

Currently, there is no household hazardous waste collection and management within the Region. It is assumed that this waste is currently being discarded with other household waste and landfilled or incinerated.

Proposed Management

The NCPR counties will participate in the State program. Each county will determine an appropriate household hazardous waste collection site; and each county will contact the State to verify necessary arrangements for a collection day. The advertising will be provided by each county. There will be at least two consecutive advertisements in a county paper to inform residents of the program, the date, times and location of collection, and types of materials to be accepted. Other advertising will be provided by each county as deemed appropriate by that county to promote program participation. A brochure on non-toxic alternatives to household hazardous waste products will be distributed to participants of the program.

Each county's cost for this program will primarily be due to labor and advertising costs since the State is providing much of the program. Figuring a wage of $10/hour with 30% for benefits, the

labor cost would be about $100. Approximately $75 might be spent to advertise the program, and another $75 for information brochures to be distributed to program participants. The utility costs are expected to be negligible. It is anticipated that any training required will be provided by the contractor during the program. County and municipal personnel will be informed of the program, should any emergency response be required due to a spill or injury.

The State finalized its contract with the private contractor who will provide the household hazardous waste program in August 1993. The schedule for implementing this program in the NCPR counties will depend upon the availability of the contractor.

WASTE TIRES

No whole tires will be allowed in Class I landfills or incinerators for disposal effective January 01, 1995. Each county must provide a temporary storage facility for waste tires by this date directly, by contract, or through a solid waste authority if no other collection site is available. Since landfills will be required to provide for the collection of tires after January 1, 1995, counties with landfills will not have to provide additional collection sites. Tires may not be stored for longer than one (1) year without written approval from the Department of Environment and Conservation.

The State has contracted for six (6) mobile tire shredding units. The counties can make arrangements with the contractor to have stored tires shredded and disposed of in a Class I or Class IV landfill. This program has already been implemented in the NCPR.

Current Management

Macon County is currently collecting tires at its landfill. The storage space was developed by building an 18-inch dirt wall around a gravel bottom; the cost was undetermined. The State contractor has shredded tires at this site twice: 9,000 tires in November 1992 and 8,000 tires in March 1993. However, the contractor quartered the tires which was unacceptable by the State Inspector, and the tires were held in storage. The County hopes to sell the tires for recycling. According to the Department of Revenue, an estimated 13,579 tires were sold in Macon County during fiscal year 1993; the storage and shredding operation is adequate for waste tires generated. The operating cost for the storage site, vector control, and shredding operation support was undetermined. The County does not have any set format for addressing illegal waste tire dumps but will proceed as the State requires in the future.

Smith County has a tire storage site at the Smith County Landfill. This site was recently established in the fall of 1993. According to the Department of Revenue, an estimated 8,213 tires were sold in Smith County during fiscal year 1993. The County does not have any set format for addressing illegal waste tire dumps but will proceed as the State requires in the future.

Trousdale County collects tires at its convenience center and at the County landfill. A maximum of 4 tires per person are accepted at the convenience center. Greater numbers of tires must be taken to the County landfill for disposal at $1.75 per cubic yard. The State's contractor shredded

an estimated 1,500 tires in April 1993. The shredded tires are disposed in the County landfill. According to the Department of Revenue, an estimated 4,720 tires were sold in Trousdale County during fiscal year 1993; the storage and shredding operation would be adequate for all tires although most tires are not delivered to the County. The operating costs for the storage site, vector control, and shredding operation support are undetermined. The County does not have any set format for addressing illegal waste tire dumps but will proceed as the State requires in the future.

Proposed Management

The NCPR feels that as a region, the counties should be able to work together in the provision of waste tire collection and management. However, as the State law is currently written, each county must provide for the collection and management of problem wastes within each county. The NCPR will work with the State to express concerns regarding the hardship upon individual counties to provide this service. In the event that the law is not changed to allow this, plans for individual county provision of the service are provided below.

Each county will provide for a waste tire collection site as mandated by the State. Macon County and Smith County will continue to collect and manage tires at their landfills after landfill closure. Trousdale County will develop a site on Tennessee Valley Authority property after the county landfill closes.

The shredded tires are currently landfilled at a Class I facility and may continue to be managed in this manner. The costs for developing waste tire storage and shredding sites are estimated to be $2,000 for Macon, $2,000 for Smith, and $1,000 for Trousdale County.

AUTOMOTIVE FLUIDS

The Tennessee Solid Waste Planning Act of 1991 provides that *used oil* will no longer be allowed in Class I landfills or incinerators effective January 01, 1995. The Act further provides that each county must provide at least one collection site for *used oil and other automotive fluids* by this date directly, by contract, or through a solid waste authority unless adequate collection opportunities already exist in the county. Automotive fluids include gasoline, anti-freeze, brake fluid, transmission fluid, power steering fluid, windshield fluids, and motor oil.

Used automotive fluids often contain metals acquired by circulation through the vehicle which may make them toxic. The improper disposal of these fluids may contaminate the soil and water. Additionally, the improper disposal of anti-freeze can poison animals who are attracted to its sweet taste.

Transmission fluid has similar characteristics to motor oil and in some cases may be blended together prior to recycling. However, the purchaser of these fluids should be consulted before

approving the mixing of these two fluids. Equipment has been developed that will filter contaminants and replace the additives to used anti-freeze. The recycled anti-freeze is returned to the owner for reuse. Some service stations may offer this option.

Existing Management

None of the counties provide for the collection of all automotive fluids. It is assumed that most automotive fluids are taken to local service stations, stored, or improperly disposed. However, a recent non-residential recycling survey showed that during 1992 respondents recycled 5 tons in Macon County, 93 tons in Smith County, and 72 tons in Trousdale County.

Proposed Management

Each of the NCPR counties will provide for the collection of automotive fluids by providing collection sites for waste oil and transmission fluid. The NCPR feels that as a region, the counties should be able to work together in the provision of automotive fluid collection and management. However, as the State law is currently written, each county must provide for the collection and management of problem wastes within each county. The NCPR will work with the State to express concerns regarding the hardship upon individual counties to provide this service. In the event that the law is not changed to allow this, plans for individual county provision of the service are provided below.

Each county will advertise the collection site and hours that fluids will be accepted. It will be each County's responsibility to ensure that the assistance is provided where necessary to those delivering waste automotive fluids, and that the collection receptacles are easily accessible for use where applicable.

It is not definite at this time where the collection sites will be located. However, it is anticipated that all counties will develop a site at their tire storage sites or work with the schools which might utilize the oil and transmission fluid for fuel.

LEAD-ACID BATTERIES

Lead-acid batteries will no longer be allowed in Class I landfills or incinerators effective January 01, 1995. Each county must provide at least one collection site for waste batteries by this date either directly, by contract, or through a solid waste authority. An exception is made if adequate collection site(s) are presently available, for example, through a non-profit organization. Although State law requires lead-acid battery retailers to accept old batteries as trade-ins, many households and businesses have accumulated old batteries in their garages.

Lead-acid batteries are used in automobiles, motorcycles, trucks, tractors, boats, jet skis, riding lawn mowers, and off-road vehicles. The electricity produced by these batteries is generated by a chemical reaction between sulfuric acid and lead. The components in a battery do not wear out, they just get dirty. Battery recyclers convert spent batteries into useable lead, sulfuric acid and plastic.

Existing Management

Trousdale County accepts lead-acid batteries at their convenience center. The batteries are sold to Goolsby Scrap in Gallatin. None of the remaining counties provide for the collection of lead-acid batteries.

Proposed Management

The NCPR feels that as a region, the counties should be able to work together in the provision of lead-acid battery collection and management. However, as the State law is currently written, each county must provide for the collection and management of problem wastes within each county. The NCPR will work with the State to express concerns regarding the hardship upon individual counties to provide this service. In the event that the law is not changed to allow this, plans for individual county provision of the service are provided below.

Each of the NCPR counties will provide a collection site for waste lead-acid batteries. It will be each County's responsibility to advertise this service, to ensure that assistance is provided to those delivering batteries where necessary, and that the collection receptacle is easily accessible for use where applicable. It is assumed at this time that lead-acid batteries collection sites will be located at the tire storage sites in Macon, and Smith Counties and at the convenience center in Trousdale County.

WHITE GOODS

Although Tennessee has not required that counties address white goods management, the NCPR intends to evaluate this option. The Region's concern is that federal regulations will make the proper management of white goods more difficult and expensive resulting in greater illegal dumping of these items.

White goods consist of large, metal household appliances such as washers, dryers, stoves, refrigerators, freezers, dishwashers and air conditioners. These items have traditionally been processed for scrap or landfilled. However, in the last several years additional information indicates that they contain potentially harmful components. Many white goods, particularly those that were manufactured prior to 1970, have electrical capacitors or lighting ballasts which contain polychlorinated biphenyls (PCBs). This material is a carcinogen (causes cancer) and its disposal is regulated under the Federal Toxic Substance Control Act (TSCA) of 1976. When these materials are processed or crushed, the release of PCB contaminated oil may occur. In 1979, EPA regulations banned any further manufacture of PCB. However, an exemption was granted so that companies that had existing inventories of capacitor could use up their remaining stocks. As a result, capacitors containing PCBs may have been used as late as 1984. Current federal regulations exempt capacitors from TSCA regulations provided they remain intact and the PCBs are not released into the environment. PCB contaminated oils are found predominantly, but not

exclusively in air conditioners, fluorescent light ballasts, dehumidifiers, microwave ovens, submersible pumps, mercury vapor lamps, furnace blower motors, and electrical control panels. It is not normally found in refrigerators, washing machines, dryers and fans. However, it can be found in most commercial appliances.

Another issue concerning white good (and automobile) processing is a fluid collection system for refrigerants. The long-term impact to the environment of these chemicals is the emission of chlorine molecules which destroy molecules in the ozone layer which protects us from ultra-violet rays of the sun. Every refrigerator, freezer and air conditioning system uses refrigerants - most commonly chlorofluorocarbons (CFCs) and more recently hydrochlorofluorocarbons (HCFCs), both of which contain chlorine. When a white good is disposed or repaired, the piping system containing the liquid refrigerant is broken either accidentally or deliberately. Once the loss of pressure occurs, the liquid quickly reverts to a gas and dissipates into the atmosphere.

Current Management

Currently, Trousdale County provides for the collection and recycling of white goods. This is accomplished at their convenience center where white goods can be delivered. Sumner County provides white goods drop-off at the RASCO facility.

According to the Federal TSCA regulations, PCBs are only regulated once the contaminant is released. This means that capacitors containing PCBs can be disposed of as municipal solid waste as long as they are not detached from the appliance. However, once detached from the appliance, PCB containing capacitors are classified as hazardous waste and must be managed as such.

Effective June 14, 1993, the Federal Clean Air Act establishes a recycling program for ozone-depleting refrigerants recovered during the servicing and disposal of air conditioning or refrigeration equipment. Together with the prohibition on venting during servicing, repair, and disposal of these substances that took effect on July 1, 1992, these regulations should substantially reduce emissions of ozone-depleting refrigerants. The regulations require persons servicing air conditioning and refrigeration equipment to observe certain service practices that reduce refrigerant emissions and establish equipment and off-site reclaimer certification programs, as well as a technician certification program. A sales restriction on refrigerant is included, whereby only certified technicians will legally be authorized to purchase such refrigerant.

In addition to the above, other features of the Act amendments were created to provide further incentives for the recycling of refrigerants and development of less harmful substitutes: an increased excise tax, effective January 1, 1993 raises the cost of the virgin substances; and a phase-out of these refrigerants over the next several years will require the recycling of existing refrigerants to supply the appliances and automobiles of today designed to utilize them.

Proposed Management

The NCPR counties will provide for the collection of white goods. The counties will coordinate this program to provide a certified person and equipment to extract and recycle the refrigerants and remove capacitors and other parts as required by the white goods market.

It is estimated that a refrigerant extractor will cost between $1,700 and $2,500 including extra tanks for the various types of refrigerants. It is also estimated that white goods stripped of their compressors (which contain the refrigerant) and capacitors will bring an estimated $20 per ton upon delivery to a scrap dealer. There will be an additional cost of disposing of any capacitors which contain PCBs to be determined by the quantity disposed at a hazardous waste management facility.

LITTER

The Tennessee Department of Transportation provides a Litter Grant Program to assist counties in cleaning up along highways. Region counties have utilized these funds in the past; Trousdale County was given the 1992 Award of Excellence by the Clean Tennessee Advisory Committee. These funds include a percentage which must be utilized for education. The NCPR will utilize these funds to provide for education of all solid waste management including litter as it is only when people take responsibility for all the waste that they generate that the litter problem can be improved. However, it is important to recognize that additional funds will need to be combined with the litter grant education funds to provide for the adequate education and information program. This program was discussed in Chapter 9.

The Program requirements provide five target groups for education: the media, the general public, students, government officials, and the business sector. Macon, Smith and Trousdale Counties must target three of these groups. The following is a listing of the funds available to these counties through the State program. Table X-1 presents Problem Waste Programs Budget by Fiscal Year. Table X-2 presents the implementation schedule.

State Litter Grant Program
Public Education Funds by County

County	FY 1993-1994 TOTAL	FY 1993-1994 Education Funds		FY 1994-1995 Education Funds		FY 1995-1996 Education Funds	
Macon County	$21,242	10%	$ 2,142	15%	$ 3,186	20%	$ 4,248
Smith County	$20,210	5%	1,010	10%	$ 2,020	15%	$ 3,030
Trousdale County	$20,210	5%	1,010	10%	$ 2,020	14%	$ 3,030
REGION	$61,662		$4,162		$7,226		$10,308

Table X-1
Problem Waste Programs Budget
by Fiscal Year

Activity	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003
Revenues:										
General Fund	$6,000	$11,960	$9,927	$10,152	$10,385	$10,626	$10,876	$11,134	$11,401	$11,677
Sale of Materials	500	500	500	500	500	500	500	500	500	500
State Oil Equipment Grants	0	16,950	0	0	0	0	0	0	0	0
Litter Management Grants	57,517	54,434	51,351	51,351	51,351	51,351	51,351	51,351	51,351	51,351
Other Grants	0	0	0	0	0	0	0	0	0	0
Total Revenues	**$64,017**	**$83,844**	**$61,778**	**$62,003**	**$62,236**	**$62,477**	**$62,726**	**$62,984**	**$63,251**	**$63,528**
Expenditures:										
Litter Management:	$57,517	$54,434	$51,351	$51,351	$51,351	$51,351	$51,351	$51,351	$51,351	$51,351
Waste Tire Management:	6,000	6,210	6,427	6,652	6,885	7,126	7,376	7,634	7,901	8,177
Automotive Fluid Management:										
Oil Storage Containers	0	7,500	0	0	0	0	0	0	0	0
Other Fluid Containers	0	3,000	0	0	0	0	0	0	0	0
Oil Filter Crusher	0	4,500	0	0	0	0	0	0	0	0
Printing Informational Material	0	4,500	0	0	0	0	0	0	0	0
Oil Contamination Kits	0	450	0	0	0	0	0	0	0	0
Contract for Management	0	750	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Lead-Acid Battery Management:	0	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Household Hazardous Waste:	500	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Total Expenditures	**$64,017**	**$83,844**	**$61,778**	**$62,003**	**$62,236**	**$62,477**	**$62,726**	**$62,984**	**$63,251**	**$63,528**
Net Revenues/Expenditures	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Note 1.) The *Sale of Materials* revenue is for the sale of lead-acid batteries.

Note 2.) The *State Oil Equipment Grants* revenue is a State grant for oil tank/container ($2,200), spill span ($300), oil filter crusher ($1,500), testing kits for detecting contaminated oil ($150), and printing and distribution of program information/education materials ($1,500). This grant will be applied for by each county by May 1, 1995.

Note 3.) The *Litter Management Grants* revenue is the total grant minus the portion appropriated for education as reported by the State Highway Department. The education portion is shown in the Education Program Budget in Chapter 9.

Note 4.) The *Contract for Management* expense for automotive fluids is expected to be negligible as contractors will pick up the oil, brake fluid and hydraulic fluid for free.

Table X-2
Problem Waste Programs
Implementation Schedule

		1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1999-
		Quarters	Quarters	Quarters	Quarters	Quarters	2003
1	Overview by Each County						
2	Develop Problem Waste Management Measurement System						
3	Provide Problem Waste Management Data to Region for State Report						
4	Each County Continues Tire Collection Service						
5	Each County Provides Household Hazardous Waste Day						
6	Each County Evaluates Private Collection Opportunities						
7	Each County Provides Required Problem Waste Collection Opportunities						
8	Each County Provides Programs Information to the Public						
9	Evaluate Funding Sources including State Grants						
10	Apply for State Oil Collection Equipment/Burn Grant Funds						

Five-Year Milestone Achievements	*Date*
Macon County Provides Automotive Fluid Collection	Jan 1, 1995
Smith County Provides Automotive Fluid Collection	Jan 1, 1995
Trousdale County Provides Automotive Fluid Collection	Jan 1, 1995
Macon County Provides Lead-Acid Battery Collection	Jan 1, 1995
Smith County Provides Lead-Acid Battery Collection	Jan 1, 1995
Trousdale County Provides Lead-Acid Battery Collection	Jan 1, 1995

CHAPTER 11

IMPLEMENTATION

SYSTEM DEFINITION

The NCPR has determined that the member counties will continue to work together in developing their solid waste management systems. An education program will be an important component of this system to instruct residents and businesses about responsible solid waste management including waste reduction. An education coordinator will be selected to develop a program and work with the individual counties and municipalities. Trousdale County will continue to develop its own education program which it considers to be very successful.

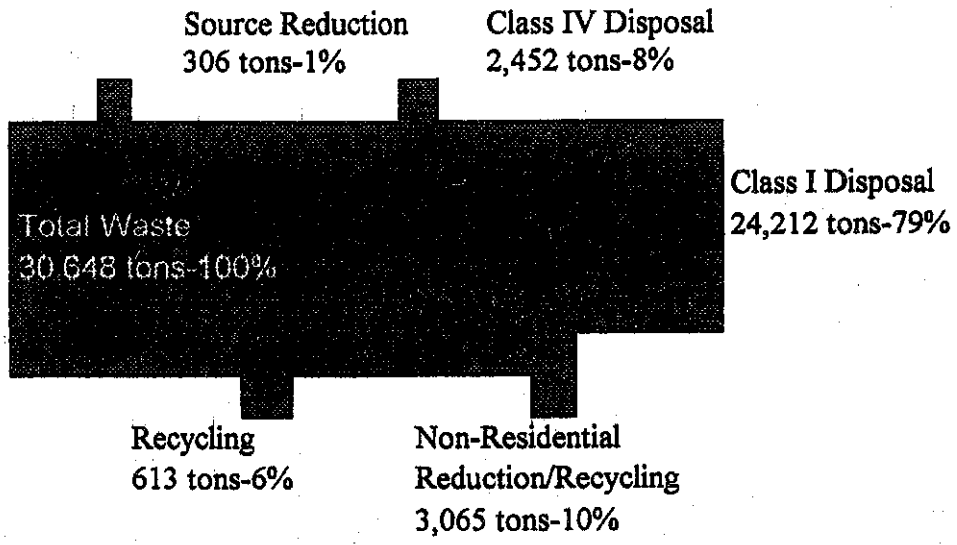
Waste reduction efforts will continue in each county. Each county has a recycling program in place except for Smith County which will develop a drop-off recycling program in 1995. The current recycling programs may be expanded in the future as the counties gain experience in program management and marketing.

Macon, Smith, and Trousdale Counties will develop a transfer station near Hartsville. Waste will be hauled by collection trucks to the transfer station, transfered to long-distance trucks, and hauled to an out-of-region landfill. The landfill will be determined by requests for proposals; preliminary estimates were gathered and are shown in Chapter 8.

As noted throughout this plan, Smith County is evaluating the option of developing its own landfill. However, the County is not at a stage to make a definite decision. The Region counties have determined that Smith County will be allowed to continue evaluation of this option. Macon, Smith, and Trousdale Counties will continue plans to develop a transfer station as discussed above. However, if Smith County determines to develop its own landfill, the Region will amend this plan to reflect that decision and to determine how Macon and Trousdale Counties will proceed. Chapter 5 has evaluated the development of a transfer station for the three counties as well as for two counties should Smith County not be included.

The following Table XI-1 provides the anticipated management of total solid waste generation in the Region during 1995. The total waste generation includes substantial quantities of waste generated and recycled by the non-residential sector. This was discussed in the Waste Reduction section - Chapter 4.

Table XI-1
Total Waste Management
1995



Map 8 provides the proposed solid waste management system. This includes the current facilities and programs which will continue and facilities and programs which will be developed. The arrows represent the flow of waste from Macon and Smith Counties to the proposed transfer station in Trousdale County.

IMPLEMENTATION SCHEDULE

Table XI-2 provides the implementation schedule for the entire solid waste management system for the next ten (10) years. The region will meet projected annual operating and maintence cost as shown in Tables VI-3 and V-4.

STAFFING AND TRAINING REQUIREMENTS

Table XI-3 provides the staffing and training requirements for the development of the solid waste management system. Although the State of Tennessee only requires training for Class I landfill operation, the Region counties will ensure that all program and facility personnel are properly trained to carry out their duties effectively and efficiently. Drivers, attendants and supervisors need ten (10) hours per year training for hazardous waste screening and handling of special waste. All employees need a minimum of six (6) hours per year safety training.

BUDGET

Table XI-4 provides the budget for the solid waste management system for the next ten years. The recycling program and waste collection costs were determined by evaluating current costs from the fiscal year ending June 30, 1993 using county and municipal records.

MAP 8

Proposed Regional System

North Central Planning Region

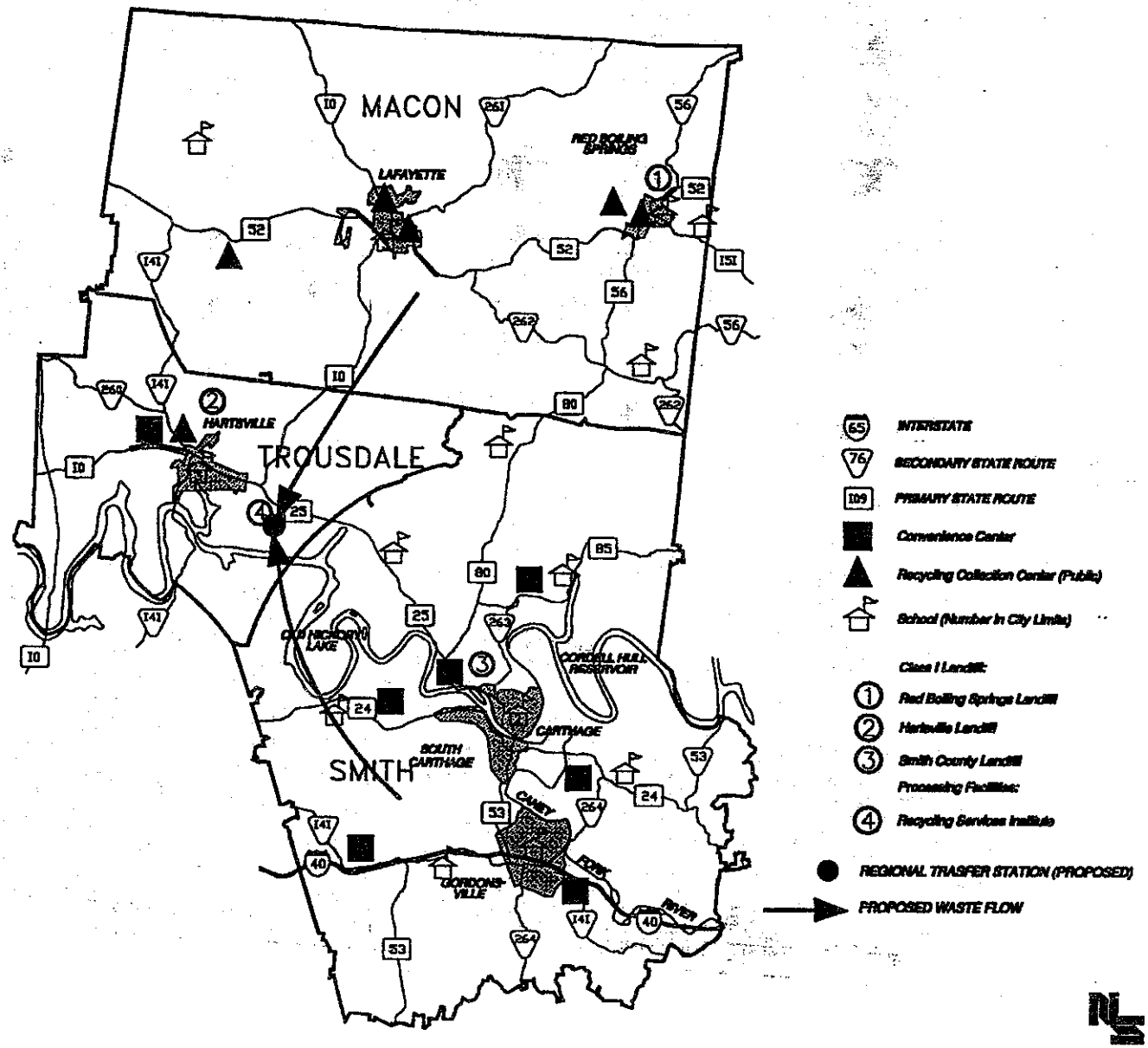


Table XI-2
Integrated Solid Waste Management Program
Implementation Schedule

		1993-1994				1994-1995				1995-1996				1996-1997				1997-1998				1999-
		Quarters				Quarters				Quarters				Quarters				Quarters				2003
	Collection and Transportation:																					
1	Acquire Property for Transfer Station																					
2	Design Transfer Station and Acquire Permit-by-Rule																					
3	Contract for Transfer Station Construction & Operation																					
4	Construct Transfer Stations																					
5	Operate Transfer Station																					
6	All Municipalities Provide for Collection of Solid Waste																					
7	All Counties Provide or Insure Collection of Solid Waste																					
8	Smith County Applies for State Convenience Center Grants (Upgrade)																					
9	Trousdale County Applies for State Convenience Center Grants (Upgrade)																					
10	Smith County Upgrades Existing Convenience Centers w/Grant																					
11	Trousdale County Upgrades Existing Convenience Centers w/Grant																					
12	Provide Annual Regional Collection Reports to the State																					
	Recycling:																					
1	Establish Annual Goals and Objectives																					
2	Develop Recycling Measurement and State Reporting Method																					
3	Provide Annual Regional Recycling Report to the State																					
4	Provide Recycling Programs Information to the Public																					
5	Work with Schools to Develop In-School Programs																					
6	Evaluate Regional Strategy for Marketing Materials																					
7	Evaluate Funding Sources Including State Grants																					
8	Evaluate Hiring Regional Recycling Coordinator																					
9	Macon County Provides Drop-Off System																					
10	Smith County Provides Convenience Center Drop-Off System																					
11	Trousdale County Provides Convenience Center Drop-Off System																					
12	Provide Transfer Station Drop-Off System																					
13	Programs Apply for State Recycling Equipment Grants																					
	Disposal Capacity Provision:																					
1	Trousdale County Class I Landfill Closes																					
2	Trousdale County Contracts for Class I Landfill Disposal																					
3	Macon County Class I Landfill Closes																					
4	Smith County Class I Landfill Closes																					
5	Region Contracts for Class I Disposal for Transfer Station Waste																					
6	Smith County Class IV Landfill Operates																					
7	Report Regional Class I Disposal to State Annually																					
8	Report Regional Class IV Disposal to State Annually																					
	Public Education Program:																					
1	Establish Annual Goals and Objectives																					
2	Provide Education Programs Information to the Public																					
3	Develop Method to Measure Education Accomplishments																					
4	Inventory Existing Education Programs/Resources																					
5	Evaluate Schools' Waste Management Curriculum																					
6	Evaluate Funding Sources Including State Grants																					
7	Prepare to Apply for Grants/Loans																					
8	Establish Network with Education Organizations/Agencies																					
9	Establish Network with Solid Waste Experts																					
10	Work with Local Education Programs for Expansion of Service																					
11	Develop Education Strategies for Various Target Audiences																					
12	Provide Solid Waste Management Workshops																					
13	Provide Speaker's Bureau for Public/Private Organizations																					
14	Educate Non-Residential Sectors to Reduce Waste																					
15	Work with Schools to Develop Special In-School Programs																					
16	Work with Local Governments to Develop Office Programs																					
	Problem Waste Programs:																					
1	Overview by Each County																					
2	Develop Problem Waste Management Measurement System																					
3	Provide Problem Waste Management Data to Region for State Report																					
4	Each County Continues Tire Collection Service																					
5	Each County Provides Household Hazardous Waste Day																					
6	Each County Evaluates Private Collection Opportunities																					
7	Each County Provides Required Problem Waste Collection Opportunities																					
8	Each County Provides Programs Information to the Public																					
9	Evaluate Funding Sources including State Grants																					
10	Apply for State Oil Collection Equipment/Burn Grant Funds																					

Table XI-3
Staffing and Training Requirements
1993 - 2003

Position	Training Required	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
General:												
Supervisors	N/A	3	3	3	4	4	4	4	4	4	4	4
Waste Collection:												
Drivers	N/A	27	28	28	28	29	29	30	30	30	30	30
Laborers	N/A											
Supervisors	N/A	3	3	3	3	3	3	3	3	3	3	3
Transfer Station:												
Attendants	N/A				2	2	2	2	2	2	2	2
Drivers	N/A											
Laborers	N/A						1	1	1	1	1	1
Supervisors	N/A											
Class II Landfill:												
Clerk	N/A	6	6	6	5	5	5	5	5	5	5	5
Operator	N/A	6	5	5	2	2	2	2	2	2	2	2
Attendants	N/A	13	12	12	12	12	12	12	12	12	12	12
Laborers	N/A	14	14	14	13	13	13	13	13	13	13	13
Class IV Landfill:												
Clerk	N/A											
Operator	N/A	2	2	2	2	2	2	2	2	2	2	2
Attendants	N/A											
Laborers	N/A	1	1	1	1	1	1	1	1	1	1	1
Recycling Program:												
Operators	N/A	1	1	1	1	1	1	1	1	1	1	1
Attendants	N/A	32	32	35	35	35	35	35	35	35	35	35
Composting Program:												
Operators	N/A											
Attendants	N/A											
Education:												
Coordinator	N/A	2	2	2	2	2	2	2	2	2	2	2

Table XI-4
Integrated Solid Waste Management Program
by Fiscal Year

Activity	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003
Revenues:										
General Fund Allocations	$551,211	$681,131	$756,831	$1,217,198	$1,110,920	$1,200,327	$1,207,380	$1,225,975	$1,313,886	$1,329,789
User Fees	382,444	489,735	516,887	675,400	593,956	647,241	660,990	675,033	723,404	736,832
Tipping Fees	234,789	229,650	286,794	154,923	110,312	129,802	151,020	161,303	172,292	184,031
Sale of Materials	500	500	1,000	1,018	1,036	1,054	1,074	1,094	1,115	1,136
Convenience Center Grants	0	100,000	0	0	0	0	0	0	0	0
Recycling Equipment Grants	0	0	20,000	15,000	0	0	0	0	0	0
State Education Grants	0	22,500	0	0	0	0	0	0	0	0
State Litter Education Grants	4,145	7,228	10,311	10,311	10,311	10,311	10,311	10,311	10,311	10,311
State Litter Management Grants	57,517	54,434	51,351	51,351	51,351	51,351	51,351	51,351	51,351	51,351
State Oil Equipment Grants	0	16,950	0	0	0	0	0	0	0	0
Total Revenues	**$1,230,606**	**$1,602,128**	**$1,643,174**	**$2,125,201**	**$1,877,885**	**$2,040,087**	**$2,082,126**	**$2,125,067**	**$2,272,359**	**$2,313,449**
Expenditures:										
Collection and Transportation	$515,507	$633,550	$729,224	$755,114	$781,926	$809,691	$838,443	$868,218	$899,053	$930,985
Recycling Programs	23,500	27,548	57,543	69,382	66,098	68,411	70,806	73,284	75,849	78,504
Disposal	623,437	827,459	784,318	1,228,390	957,315	1,089,197	1,099,840	1,110,269	1,223,894	1,230,121
Education Program	4,145	29,728	10,311	10,311	10,311	10,311	10,311	10,311	10,311	10,311
Problem Waste Programs	64,017	83,844	61,778	62,003	62,236	62,477	62,726	62,984	63,251	63,528
Total Expenditures	**$1,230,606**	**$1,602,128**	**$1,643,174**	**$2,125,201**	**$1,877,885**	**$2,040,087**	**$2,082,126**	**$2,125,067**	**$2,272,359**	**$2,313,449**
Net Expense/Revenue	$0	($0)	$0	$0	$0	$0	$0	$0	$0	$0

Note 1.) The figures in this table are a summary of all budget tables in Chapters 5-10.

CHAPTER 12

RESPONSIBILITIES

PLAN ADOPTION

This plan has been developed by the North Central Solid Waste Planning Region Board. The Board will oversee and implement many components of this plan such as a regional transfer station and regional educational efforts. However, the counties will be responsible for collection of solid waste, recyclables, and problem wastes as provided by the laws of Tennessee.

The Board has amended this plan to reflect appropriate comments submitted during the public hearings for plan review. The Board and each county thereafter adopted this plan as documented in Appendix E.

SUBMISSION

The Region is required to submit three signed copies of this plan to the Governor's State Planning Office prior to July 1, 1994.

CHAPTER 13

FLOW CONTROL AND PERMIT APPLICATION REVIEW

FLOW CONTROL

The Solid Waste Management Act of 1991 authorizes regions and solid waste authorities with approved plans to excercise two types of flow control: 1.) the out-of-region waste ban; and 2.) intra-region flow control. If an existing facility in the Region is not to be utilized by the Region Board, it must show cause in the plan. The existing disposal facilities in the Region will be utilized until closure; all Class I landfills will close prior to October 9, 1996.

The North Central Planning Region (NCPR) has not adopted any flow control requirements. Sumner County adopted flow control requirements in June 1990. The Region may consider mandating flow control in the future.

PERMIT APPLICATION REVIEW

After the plan is approved, the Region must approve any application for a construction or expansion permit for a solid waste disposal facility or incinerator within the Region as consistent with the Region's disposal needs before any permit is issued by the State of Tennessee.

The applicant must submit a copy of the permit application to the Region Planning Board at or before the time the application is submitted to the Commissioner. The Region will review the application for compliance with the provisions of the Solid Waste Management Act of 1991, and will conduct a public hearing after public notice has been given in accordance with Tennessee Code Annotated, title 8, chapter 44. The hearing will afford all interested persons an opportunity to submit written and oral comments, and the proceeding will be recorded and transcribed. The Region will render a decision on the application within ninety (90) days after receipt of a complete application. The Region will immediately notify the Commissioner of its acceptance or rejection of an application.

The Region may reject an application for a new solid waste disposal facility or incinerator or expansion of an existing solid waste disposal facility or incinerator within the Region only upon determining that the application is inconsistent with the approved solid waste management plan. The reasons for rejection must be documented in writing including the specific grounds on which the application is inconsistent with the plan.