

Tennessee's Trash in a New Century



John G. Morgan
Comptroller of the Treasury
Office of Research
June 2004



STATE OF TENNESSEE

John G. Morgan
Comptroller

COMPTROLLER OF THE TREASURY

STATE CAPITOL
NASHVILLE, TENNESSEE 37243-0264
PHONE (615) 741-2501

June 7, 2004

The Honorable John S. Wilder

Speaker of the Senate

The Honorable Jimmy Naifeh

Speaker of the House of Representatives

and

Members of the Senate Environment, Conservation, & Tourism Committee

Members of the House Conservation & Environment Committee

State Capitol

Nashville, Tennessee 37243

Ladies and Gentlemen:

Transmitted herewith is a study prepared by the Office of Research examining the implementation of the Solid Waste Management Act of 1991, and following up on previous reports released in 1996 and 1998. The report examines Tennessee's progress toward achieving the 25 percent waste reduction goal in the law, the motivation behind establishing the solid waste reduction goal, collection of solid waste data, and measuring the results of solid waste assistance grants. In addition, the report examines potential risks to groundwater posed by old, unlined landfills in Tennessee.

Sincerely,

John G. Morgan
Comptroller of the Treasury



Tennessee's Trash in a New Century

Greg Spradley
Senior Legislative Research Analyst

Ethel Detch, Director
Douglas W. Wright, Assistant Director
Office of Research
505 Deaderick Street, Suite 1700
Nashville, TN 37243
615/401-7911
www.comptroller.state.tn.us/orea/reports

John G. Morgan
Comptroller of the Treasury
State of Tennessee
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Executive Summary

Tennessee has not yet achieved the solid waste reduction goal set out by law in 1991. The legislation set a goal of 25 percent reduction in per capita solid waste, by weight, by December 31, 2003. Amendments to the law established two other methods of achieving the goal, through applying an economic growth formula and assessing the qualitative efforts of solid waste regions to try to achieve the 25 percent reduction. Neither of these measurement methods has yet been applied to the solid waste data reported by the regions.

The Solid Waste Management Act of 1991, which built upon the Solid Waste Disposal Act of 1969 and the Solid Waste Planning and Recovery Act of 1989, was the first comprehensive solid waste planning legislation in Tennessee history. The law was a response to an increasing solid waste generation rate, increased federal regulation of waste disposal facilities, and the declining disposal capacity of those facilities. The 1991 law established, among other things, planning regions to deal with waste disposal in a uniform manner. The Department of Environment and Conservation has since approved solid waste plans for each region, but the state has not yet achieved the law's per capita solid waste reduction goals. Left unchecked, solid waste can pollute Tennessee's air, water, and land; and represents resources that Tennesseans could reuse or recycle rather than disposing in landfills. Tennessee's effectiveness in dealing with solid waste disposal is critical to its economic and environmental health, and the health of its citizens as the state's population grows.

During the 2003 session of the Tennessee General Assembly, legislators asked the Comptroller's Office of Research to examine the implementation of the 1991 act. The intent of this report is to follow up on two previous reports – in 1996 and 1998 – and provide a limited evaluation of the 1991 law's implementation and to provide alternatives for its improvement. In May 2004, the General Assembly passed a bill reauthorizing the Solid Waste Management Act and extending the 75-cent tipping fee surcharge until June 30, 2008. The report concludes:

Tennessee has improved solid waste management but has not achieved the waste reduction goal as of calendar year 2002. The law established a goal to achieve a 25 percent reduction in Class I solid waste, by weight, by December 31, 2003. However, department staff indicate that they have not yet analyzed data from 2003.

Tennessee's per capita waste reduction and diversion rate, using 1995 as the base year, was 20.3 percent by weight in calendar year 2002. That compares to a 22.6 percent reduction and diversion rate for 2000 and 24 percent for 2001, according to the Department of Environment and Conservation's Division of Community Assistance (DCA). These figures caused DCA to examine why the waste reduction rate dropped.

Organizations outside state government have expressed concerns with the waste reduction and diversion goal as well as with the state's efforts to measure progress toward the goal. Tennessee's efforts to measure waste reduction have appeared unsuccessful because the General Assembly voted to change the base year by which the state measures progress toward the goal in 1999. When the General Assembly passed the original act, it

established the base year as 1989 and the goal year as 1995. Citing concerns over measuring progress toward the waste reduction goal, the General Assembly in 1999 adjusted the base year to 1995 and the goal year to 2003. The new legislation also clarified that regional planning boards could calculate waste reduction on a per capita basis, factor in economic growth when calculating waste reduction, and include waste diverted to Class III and Class IV landfills – construction, demolition, landscaping, and yard wastes.

Several issues continue to confound measurements of solid waste reduction. Some interested parties describe using diversion as a tool to meet solid waste reduction goals as a policy decision. Others believe it merely avoids more costly, environmentally friendly reduction methods. The Comptroller’s Office of Research cited diversion as a concern in the 1998 report, *Tennessee’s Trash in the 1990s, an update*, and it remains a concern today. Some argue that diverted waste should not count as a reduction because it is still disposed of in landfills. In addition, Class III/IV facilities are not regulated as strictly as Class I facilities, creating greater potential for dumping materials, such as toxic or hazardous substances, that could be problematic in the future.

Overall, concerns with solid waste management in Tennessee focus on efforts to reduce, reuse, and/or recycle solid waste. Despite Class I landfill capacity exceeding the state’s needs, some groups question: (1) whether the state’s efforts will continue to prevent the flow of waste into landfills without continued, strong oversight, and (2) whether the state provides the necessary technical and financial assistance to allow local governments to continue successful efforts and introduce new efforts. Additional concerns include hazardous waste collection and the cost of transporting waste to large, regional facilities. (See page 7.)

Various groups disagree over the motivation for setting a 25 percent reduction/diversion goal. On one hand, local government representatives maintain that the intent of the act was to address the lack of Class I landfill space and provide local governments with less costly methods of disposing of solid waste than establishing and operating Class I facilities. On the other hand, the act itself declares the policy of the state:

“ . . . in furtherance of its responsibility to protect the public health, safety, and well-being of its citizens and to protect and enhance the quality of its environment . . . ”

The act goes on to list an integrated statewide solid waste program and encouragement of source reduction, re-use, and recycling as methods to achieve a successful policy. (See page 10.)

Local governments collect solid waste data inconsistently from county to county. Also, the Division of Community Assistance does not independently verify the accuracy of the data reported, although it investigates apparent discrepancies. The resulting data provide division staff with an idea of solid waste disposal and waste reduction activities,

but not a reliable waste reduction rate. Counties collect this data from a number of sources and report to solid waste management regions. However, some counties collect data only from government-affiliated or regulated facilities such as landfills, transfer stations, and convenience centers. Other counties also survey private entities such as manufacturing plants, small businesses, and other industries to determine the amount of recycling/reduction/re-use activities in the private sector. Some private entities provide this information voluntarily, while others do not, and data provided voluntarily is not subject to verification. Class I (municipal solid waste) disposal is the most reliable data available because the statute requires Class I facilities to maintain scales to weigh the waste entering the facilities, record, and report this information to the Division of Community Assistance. Other states and the U.S. Environmental Protection Agency (EPA) have examined ways of ensuring reliable data on other waste reduction activities, but failed to find an ideal way to collect it. While additional information on private recycling/reduction/re-use activities is valuable, the 1991 statute makes clear that the goal is to reduce the waste “disposed of at Class I municipal solid waste disposal facilities and incinerators.” (See page 12.)

Getting the Numbers

Division of Community Assistance staff report that they, along with regional authorities, and local governments, have used resources to get a more accurate representation of waste reduction when those resources could be used to support local waste reduction or recycling efforts. DCA management could not quantify the resources used trying to determine an accurate waste reduction number, but listed a number of activities state and local officials have engaged in to gather, review, compile, store, retrieve, report and explain the data they can collect. (See page 13.)

The Division of Community Assistance does not examine waste reduction related to grants. As a result, local grant recipients may not be directing grant funds to most effectively help Tennessee meet the waste reduction/diversion goal. Local governments and regional solid waste authorities might need to re-examine how they spend these grant funds since the state has not achieved the goal. DCA management reports that there are so many factors that determine whether individuals and businesses participate in recycling programs, other than grants, it would be difficult to measure the impact of individual grant awards. Also, the Tennessee Governmental Accountability Act of 2002, which will extend to all state agencies by FY2011-12, requires performance measures for each program, including:

- outputs produced by the programs,
- outcomes resulting from the programs,
- baseline data associated with each performance measure, and
- performance standards. (See page 14.)

Old, unlined landfills pose an unknown contamination risk to Tennessee’s groundwater resources. Groundwater contamination from old, unlined landfills has become a greater concern since Dickson County authorities discovered toxic contaminants in private wells. Industries in the area buried toxic waste in the Dickson

County landfill before the state enacted regulations in the 1970s. Many old Tennessee landfills were in operation for years before the state and federal governments began regulating the types of waste allowed.

The Florida Department of Environmental Protection surveyed its districts to determine whether there was concern for groundwater contamination at any of its 410 known closed, unlined landfills. Of the 20 old facilities tested, ten showed indications of groundwater contamination problems. Tennessee has conducted limited assessments near previously permitted sites closed before 1990, but has not assessed the risk from older dumps that were never permitted except where citizens, local governments, or others reported problems or there were other indications that contamination might be a problem. (See page 15.)

Legislative Recommendation:

The General Assembly may wish to re-examine the intent of setting a 25 percent reduction/diversion goal when considering the next reauthorization. If maintaining adequate capacity to dispose of solid waste into the future is its sole motivation, the General Assembly could repeal the 1991 law and its 25 percent reduction/diversion goal. The legislature would then let the market dictate how and where local governments and regional authorities dispose of solid waste. However, if the law is intended to protect human health and the environment and conserve resources, legislators should consider the costs in financial and environmental terms, decide how much the state is willing to spend for environmental protection, and how much risk the state is willing to accept with regard to solid waste.

The General Assembly may wish to examine these issues more closely over the next four years and consider additional requirements at the act's next reauthorization.

Administrative Recommendations:

The Division of Community Assistance should continue to focus on per capita reductions in Class I solid waste disposal, and provide solid waste regions and local governments the technical assistance they need to develop more accurate and complete solid waste management information.

The Division of Community Assistance should develop methods of measuring the effectiveness of local governments' use of grant funds to achieve the solid waste reduction/diversion goal in the law. Examples of such measurements might be:

- The grant provided additional capacity to process recyclables.
- The grant resulted in additional recyclables collected through a new or expanded curbside recycling program.
- The grant improved the ratio of the number of convenience centers to the number of households.

- The grant helped establish ongoing recycling curricula and programs in classrooms, resulting in additional waste reductions.
- The grant ultimately resulted in a reduction in per capita waste disposed in Class I facilities.

The Department of Environment and Conservation should develop a plan to seek funding and begin to gather information on old, unlined landfills to characterize the risk of groundwater contamination in their vicinity. TDEC should also develop a plan/policy to deal with such contamination when the department discovers significant risk. The department should base assessments on historical documentation of materials that might have been dumped, the use of private wells for drinking water in the area, and the geology underlying the old landfills.

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Introduction

Tennessee's Solid Waste Management Act of 1991 established, among other things, planning regions to deal with waste disposal in a uniform manner. The state Department of Environment and Conservation has since approved solid waste plans for each region, but the state has not yet achieved the law's goal of 25 percent waste reduction. Left unchecked, solid waste can pollute Tennessee's air, water, and land. So, the way Tennessee manages its solid waste becomes more important as the state grows.

In January 1991, the University of Tennessee's Waste Management Research and Education Institute released a report that examined Tennessee's solid waste problems. The report provided insight that would lead to legislation that established statewide waste reduction goals and emphasized local planning to meet solid waste disposal capacity needs. The General Assembly passed the 1991 Solid Waste Management Act, that built on two previous laws, the Solid Waste Disposal Act of 1969 and the Solid Waste Planning and Recovery Act of 1989. In early 1996, prior to the act's reauthorization, the Comptroller of the Treasury's Office of Research published a report on implementation of the 1991 act. The General Assembly later requested the Comptroller's Office to evaluate the implementation of the act, resulting in a July 1998 report.¹ While several of the issues described in the 1998 report have been resolved, some continue to cause concern. (See Appendix A.) Members of the General Assembly in 2003 again asked the Comptroller's Office of Research to examine the implementation of the act.

This report follows up previous reports and provides a limited evaluation of the state's implementation of the reauthorized solid waste initiative's implementation as well as alternatives for its improvement. The Analysis and Conclusions section of this report addresses some issues from the 1998 report that continue to cause concern. Appendix A lists conclusions and recommendations from the 1998 report and their status.

Methodology

The conclusions in this report are based on:

1. Interviews with state solid waste officials, staff from the University of Tennessee County Technical Assistance Service (CTAS), the U.S. Environmental Protection Agency (EPA) Region 4 staff, and representatives of private sector environmental groups.
2. A review of federal and state solid waste legislation.
3. Materials produced by the Department of Environment and Conservation's (TDEC) Division of Solid Waste Management and Division of Community Assistance (DCA).
4. Newspaper and journal articles.
5. Attendance at meetings of the Municipal Solid Waste Advisory Committee.

¹ Comptroller of the Treasury, *Tennessee's Trash in the 1990's, an Update*, Office of Research, July 1998, p. 1.

Background

In 1989, the EPA established a national goal for source reduction and recycling and by 1991 had finalized stringent regulations for environmentally protective landfills.² These new regulations resulted in increased costs for solid waste disposal and the subsequent closure of many landfills across the country.³ The national goal was to achieve 25 percent recycling and source reduction rates from the 1989 levels by 1992,⁴ 28 percent by 2003, and 35 percent by 2008.⁵ Most states met or exceeded the 25 percent rate by 1992. Today, nearly all states, and many Native American communities practice integrated waste management, and average a 28 percent national recycling rate.⁶

In response to the federal actions, many states adopted legislation that emphasized planning and waste reduction, prompting state and local officials to design and implement plans for solid waste management. Tennessee's Solid Waste Management Act of 1991 strongly emphasized planning and directed local governments to define their long-term solid waste needs and formulate plans to meet those needs.⁷ The act contained three public policy goals for Tennessee:

- To institute and maintain a comprehensive, integrated, and statewide solid waste management program.
- To educate and encourage generators and haulers of solid waste to reduce and minimize the amount of solid waste to the greatest possible extent.
- To promote markets for and engage in the purchase of goods made from recovered materials and goods that are recycled.⁸

The General Assembly has amended the 1991 act several times, with major revisions at its reauthorization in 1996 and in amendments to the act in 1999. See Exhibit 1 for major changes to the original act.

² U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, *25 Years of RCRA: Building on Our Past To Protect Our Future*, (Washington, Government Printing Office, 2002) pp. 8-9.

³ Division of Community Assistance, Tennessee Department of Environment & Conservation, *Annual Report to the Governor and General Assembly on the Solid Waste Management Act of 1991 Fiscal Year 2002-2003*, January 2004, p. 2; Comptroller of the Treasury, *Tennessee's Trash in the 1990's, an Update*, Office of Research, July 1998, p. 1; Division of Community Assistance, Tennessee Department of Environment & Conservation, *Update to the 1989 Report – Managing Our Waste: Solid Waste Planning for Tennessee*, October, 2003, p. 1; Interview with Mike Apple, Director of Solid Waste Management, Tennessee Department of Environment & Conservation, September 25, 2003; and Interview with Doug Goddard, Chair of the Municipal Solid Waste Advisory Committee, December 18, 2003.

⁴ U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, *25 Years of RCRA: Building on Our Past To Protect Our Future*, (Washington, Government Printing Office, 2002) p. 8.

⁵ Phone interview with Pamela Swingle, Environmental Scientist, RCRA Programs Branch, EPA Region 4, Atlanta, January 6, 2004.

⁶ U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, *25 Years of RCRA: Building on Our Past To Protect Our Future*, (Washington, Government Printing Office, 2002) p. 8.

⁷ Comptroller of the Treasury, *Tennessee's Trash in the 1990's, an Update*, Office of Research, July 1998, p. 1.

⁸ Public Chapter 451, 1991; Title 68, Chapter 211, Part 8, *Tennessee Code Annotated*.

Exhibit 1: Legislative History of Solid Waste Management in Tennessee

Year & Public Chapter	Major Provisions*
<p>1991 - Public Chapter 451: "The Solid Waste Management Act of 1991"</p>	<ul style="list-style-type: none"> • Established 25 percent per capita state waste reduction goal, with 1989 as base year and 1995 as goal year; • Established Development Districts as solid waste planning districts; required plans for 10-year disposal capacity, and annual progress reports; • Established state municipal solid waste advisory committee; • Required by Jan. 1, 1995 that each county have at least one solid waste collection and disposal system; • Required waste haulers to register with TDEC, keep records and report on waste hauled; • Required Class I facilities to have scales and maintain records of waste disposed; • Established tipping fee surcharge (85 cents), tire pre-disposal fee (\$1.00), and Solid Waste Management Fund, and authorized grants to be paid out of these funds; and • Required the establishment of a state solid waste planning and management database.
<p>1996 – Public Chapter 846: Reauthorization of the original act</p>	<ul style="list-style-type: none"> • Repealed waste hauler registration; • Re-authorized tipping fee surcharge and tire pre-disposal fee, but lowered the surcharge incrementally from 85-cents to 75-cents; • Clarified that diversion of wastes to Class III/IV landfills counted toward solid waste reductions; and • Mandated reporting of "green boxes," and allowed only those in existence before January 1, 1996 to remain.
<p>1999 – Public Chapter 384: "The 1999 Amendments"</p>	<ul style="list-style-type: none"> • Extended the 75-cent tipping fee surcharge to June 30, 2004; • Established 1995 as the new base year and December 31, 2003 as the new date for achieving the 25 percent reduction goal; • Allowed waste reduction calculations to be done on an economic growth basis; • Provided for qualitative assessments of regions' efforts to reduce solid waste if regions do not achieve the reduction goal, to determine whether the regions' efforts are equivalent to other regions that have met the goal.
<p>2004 – Reauthorization</p>	<ul style="list-style-type: none"> • Reauthorized the 75-cent tipping fee surcharge and allowed regional 10-year plans to be revised at any time to reflect developments in the region.

*This list is not all-inclusive; these acts contain other provisions not listed here.

Implementing Agencies

Two divisions of the Department of Environment and Conservation govern all matters regarding solid waste in Tennessee. The Division of Community Assistance (DCA) is non-regulatory and aids local governments in planning for their solid waste needs through its grants administration and waste reduction sections. The Division of Solid Waste Management, which is regulatory, promulgates solid waste disposal regulations, issues site permits for solid waste disposal facilities, and enforces regulations for the various types of solid waste facilities.⁹

The state Solid Waste Disposal Control Board and the Municipal Solid Waste Advisory Committee (MSWAC) aid in the act's implementation as well. The Solid Waste Disposal Control Board is a regulatory, rulemaking body. Meeting six times a year, the board oversees and hears local government appeals of state solid waste decisions. The MSWAC helps continue a dialogue among state agencies, private businesses, and environmental/special interest groups. By law, the commissioner of environment and conservation appoints committee members in consultation with statewide organizations representing the various solid waste interests on the committee.¹⁰ DCA appointed a Solid Waste Management Act (SWMA) Review Task Force in conjunction with the MSWAC in 2001. MSWAC members asked the task force to review the act and make recommendations for changes to the law.¹¹ The task force presented its recommendations to the MSWAC at its meeting in June 2003. At its October 2003 meeting, MSWAC members discussed the merits of each recommendation, lending support to some and passing others on to the commissioner to determine legislative actions the department may wish to request.¹² Appendix B contains the task force's recommendations.

Disposal Facilities

Authorities dispose of solid waste in various types of facilities. State rules identify disposal facilities as Classes I-IV (from 1200-1-7-.01, *Rules of the Tennessee Department of Environment and Conservation, Division of Solid Waste Management.*)

- A Class I disposal facility is a sanitary landfill which serves a municipal, institutional, and/or rural population and is used for disposal of domestic wastes, commercial wastes, institutional wastes, municipal solid wastes, bulky wastes, landscaping and land clearing wastes, industrial wastes, construction/demolition wastes, farming wastes, dead animals, and special wastes.

⁹ Interview with Mike Apple, Director of Solid Waste Management, Tennessee Department of Environment & Conservation, September 25, 2003; Interview with Ron Graham, Director of Community Assistance, Tennessee Department of Environment & Conservation, September 23, 2003; Comptroller of the Treasury, *Tennessee's Trash in the 1990's, an Update*, Office of Research, July 1998, p.4.

¹⁰ Comptroller of the Treasury, *Tennessee's Trash in the 1990's, an Update*, Office of Research, July 1998, p. 4; §68-211-841, Tennessee Code Annotated.

¹¹ Division of Community Assistance, Tennessee Department of Environment & Conservation, *Annual Report to the Governor and General Assembly on the Solid Waste Management Act of 1991 Fiscal Year 2001-2002*, January 2003, p. 4.

¹² Division of Community Assistance, Tennessee Department of Environment & Conservation, *Annual Report to the Governor and General Assembly on the Solid Waste Management Act of 1991 Fiscal Year 2002-2003*, January 2004, p. 1.

- A Class II disposal facility is a landfill which receives waste generated by one or more industrial or manufacturing plants and is to be used for the disposal of solid waste generated by such plants. These wastes may include industrial wastes, commercial wastes, institutional wastes, farming wastes, bulky wastes, landscaping and land clearing wastes, construction/demolition wastes, and shredded automotive tires. A Class II disposal facility may also serve as a monofill for ash disposal from the incineration of municipal solid waste.
- A Class III disposal facility is a landfill which is used for the disposal of farming wastes, landscaping and land clearing wastes, demolition/construction waste, shredded automotive tires, and/or certain wastes having similar characteristics and approved in writing by the department.
- A Class IV disposal facility is a landfill that is used for the disposal of demolition/construction wastes, shredded automotive tires, and certain wastes having similar characteristics and approved in writing by the department.

Financing Solid Waste Programs

To help finance solid waste management activities in Tennessee, the 1991 law established the Solid Waste Management Fund. The act authorizes a 75-cent surcharge on each ton of municipal solid waste received at Class I solid waste disposal facilities or incinerators to be deposited into the fund. The 1999 amendments to the SWMA extend the payment of this surcharge to June 30, 2004. Proceeds from the tire pre-disposal fee imposed on the retail sale of new tires also go into the fund to help local governments handle and dispose of waste tires. Retail tire dealers collect \$1.00 for each tire they sell, keeping 10 cents for administrative purposes and remitting 90 cents to the Department of Revenue for deposit into the SWMF.¹³ However, according to DCA management, county officials have complained that the \$70/ton they receive through Waste Tire Grants does not cover their costs for directing waste tires to beneficial end uses.¹⁴

Exhibit 2: Expenditures from the Solid Waste Management Fund, FY2002-03

	Expenditures	Percent of Total
Grants	\$6,631,745	78%
Administrative Overhead	\$705,819	8%
Technical Assistance/ Program Oversight	\$1,198,880	14%
Total Expenditures	\$8,536,444	100%

Source: Division of Community Assistance, Tennessee Department of Environment & Conservation, *Annual Report to the Governor and General Assembly on the Solid Waste Management Act of 1991 Fiscal Year 2002-2003*, January 2004, p. 9.

¹³ Ibid., p. 1.

¹⁴ Interview with Joyce Dunlap, Manager, Solid Waste Assistance Programs, Division of Community Assistance, Tennessee Department of Environment & Conservation, December 9, 2003; Interview with Doug Goddard, Chair of the Municipal Solid Waste Advisory Committee, December 18, 2003.

Exhibit 3: Solid Waste Management Fund Revenues, FY2002-03

	Revenues	Percent of Total
Landfill Surcharge Fee	\$5,101,352	55%
Tire Predisposal Fee	\$4,234,577	45%
Total Revenues	\$9,335,929	100%

Source: Division of Community Assistance, Tennessee Department of Environment & Conservation, *Annual Report to the Governor and General Assembly on the Solid Waste Management Act of 1991 Fiscal Year 2002-2003*, January 2004, p. 9.

Waste Tires

Waste tires continue to be an important issue in Tennessee. The 1999 amendments prohibited disposal of shredded tires in landfills after July 1, 2002. On June 30, 2002, all counties except Shelby County had commitments to send tires to end-users. According to DCA management, Tennessee sent all waste tires to a beneficial end use by Fall 2003.¹⁵ DCA continues to monitor the waste tire manifests and assess whether tire dealers who deliver tires to the county sites are paying the tire pre-disposal fee required by TCA 67-4-1604. The division also has a database to track waste tires to beneficial end uses and that helps to reconcile waste tire manifests to a Department of Revenue database that contains Tire Pre-Disposal Fee payments. Reconciliation is not perfect but can show major discrepancies that might indicate problems and initiate follow-up. The division also continues to monitor waste tire manifests from tire dealers to reduce the likelihood that they dump tires illegally or that out-of-state haulers dispose of waste tires in Tennessee without paying the pre-disposal fee.¹⁶

¹⁵ Division of Community Assistance, Tennessee Department of Environment & Conservation, *Annual Report to the Governor and General Assembly on the Solid Waste Management Act of 1991 Fiscal Year 2002-2003*, January 2004, p. 1; Interview with Ron Graham, Director of Community Assistance, Tennessee Department of Environment & Conservation, September 23, 2003.

¹⁶ Interview with Joyce Dunlap, Manager, Solid Waste Assistance Programs, Community Assistance Division, Tennessee Department of Environment & Conservation, December 9, 2003.

Analysis and Conclusions

The Solid Waste Reduction Goal

Tennessee has improved solid waste management but has not achieved the waste reduction goal as of calendar year 2002. The law established a goal to achieve a 25 percent reduction in Class I solid waste, by weight, by December 31, 2003. However, department staff indicate that they have not yet analyzed data from 2003.

Tennessee's per capita waste reduction and diversion rate, using 1995 as the base year, was 20.3 percent in calendar year 2002.¹⁷ (See Appendix C for region and county reduction rates.) That compares to a 22.6 percent reduction and diversion rate for 2000 and 24 percent for 2001, according to the Department of Environment and Conservation's Division of Community Assistance (DCA).¹⁸ The figures, outlined in DCA's Annual Report to the Governor caused DCA to examine why the waste reduction rate dropped. The law allows regions to calculate the reduction rate on an economic growth basis, and requires DCA to conduct qualitative assessments for regions that do not meet the goal. These additional measures should provide a better indication of local opportunities to reduce Class I waste, including local government efforts to reduce Class I waste. However, if such activities do not reduce Class I waste per capita, by weight, state and local authorities should investigate other factors that might influence whether or not individuals and businesses actually participate in recycling/reduction/reuse activities. Convenience of participation, cost to businesses and individuals, marketing of recyclable materials, and the public's knowledge of available opportunities for waste reduction also may influence participation.

Despite the reduction/diversion rates listed above, DCA's annual report indicates progress in reducing the amount of solid waste entering Class I facilities. The number of recycling collection and processing facilities in Tennessee has increased from 160 in 1992 to 580 documented centers in the division's latest annual report. This number includes centers operated by county and city governments, non-profit organizations, and for-profit recycling businesses.¹⁹ To date 460 permitted convenience centers exist in Tennessee, and all 95 counties have at least one convenience center for their citizens. In 1989, 29 counties reported that they provided no collection services to their citizens, and there were over 4,500 "green boxes" (unattended waste collection centers) throughout the

Exhibit 4: Reported "Green Boxes"

Year	"Green Boxes"
1989	4,500+
1996	1,124
2003	139

Source: Division of Community Assistance, Tennessee Department of Environment & Conservation, *Update to the 1989 Report – Managing Our Waste: Solid Waste Planning for Tennessee*, October 2003, p. 2.

¹⁷ Division of Community Assistance, Tennessee Department of Environment & Conservation, *Annual Report to the Governor and General Assembly on the Solid Waste Management Act of 1991 Fiscal Year 2002-2003*, January 2004, p. 2.

¹⁸ Division of Community Assistance, Tennessee Department of Environment & Conservation, *Annual Report to the Governor and General Assembly on the Solid Waste Management Act of 1991 Fiscal Year 2001-2002*, January 2003, p. 5.

¹⁹ Division of Community Assistance, Tennessee Department of Environment & Conservation, *Annual Report to the Governor and General Assembly on the Solid Waste Management Act of 1991 Fiscal Year 2002-2003*, January 2004, p. 2.

state.²⁰ In 1996, 25 counties were still using green boxes to some extent and reported a total of 282 sites comprised of 1,124 receptacles. The number of reported receptacles per county ranged from one to 167.²¹ As of October 2003, counties reported only 139 “green boxes,” and 27 counties reported a higher level of service than that provided in 1989.²² (TCA 68-211-851(d)(1), allows for the continued use of green boxes by counties that had these receptacles in place on July 1, 1997. New sites may not be established.) Also, since 1995, TDEC has provided grants for counties to collect waste tires for beneficial end uses such as tire-derived fuel, resulting in the diversion of over nineteen million tires from landfills.²³

Outside Concerns with the Goal

Organizations outside state government have expressed concerns with the waste reduction and diversion goal as well as with the state’s efforts to measure progress toward the goal. Tennessee’s efforts to measure waste reduction have appeared unsuccessful because the General Assembly voted twice to change the base year by which the state measures progress toward the goal.²⁴ When the General Assembly passed the original act, it established the base year as 1989 and the goal year as 1995. When the General Assembly reauthorized the act in 1996, TDEC reported that it could not be sure that its base year numbers were accurate because many landfills had not purchased scales by that year, and the division had trouble measuring household recycling and other reduction efforts. In addition, some wondered whether counties could report private entities’ reduction and recycling efforts as reductions. DCA management reported that in 1999, the General Assembly voted to adjust the base year to 1995 and the goal year to 2003 because of these concerns. Additionally, the new legislation clarified that regional planning boards could calculate waste reduction on a per-capita basis, they could factor in economic growth when calculating waste reduction, and that waste diverted to Class III/IV landfills would count toward waste reduction.²⁵

Even with these clarifications in the law, some issues continue to confound measuring solid waste reduction. One such issue is using diversion as a tool to meet solid waste reduction goals. Several people interviewed indicated that allowing diversion was a

²⁰ Division of Community Assistance, Tennessee Department of Environment & Conservation, *Update to the 1989 Report – Managing Our Waste: Solid Waste Planning for Tennessee*, October 2003, p. 2.

²¹ Comptroller of the Treasury, *Tennessee’s Trash in the 1990’s, an Update*, Office of Research, July 1998, p. 12.

²² Division of Community Assistance, Tennessee Department of Environment & Conservation, *Update to the 1989 Report – Managing Our Waste: Solid Waste Planning for Tennessee*, October 2003, p. 2.

²³ Division of Community Assistance, Tennessee Department of Environment & Conservation, *Annual Report to the Governor and General Assembly on the Solid Waste Management Act of 1991 Fiscal Year 2002-2003*, January 2004, p. 2.

²⁴ Division of Community Assistance, Tennessee Department of Environment & Conservation, *Update to the 1989 Report – Managing Our Waste: Solid Waste Planning for Tennessee*, October 2003, p. 1; Callaway, Will; Executive Director, Tennessee Environmental Council, “Re: solid waste management,” E-mail to the author, January 15, 2004; Wood, Bruce; President, Bring Urban Recycling to Nashville Today, “Re: Analysis of Tennessee 1991 Solid Waste Act,” letter to the author, January 29, 2004;.

²⁵ §68-211-861, *Tennessee Code Annotated*; Division of Community Assistance, Tennessee Department of Environment & Conservation, *Annual Report to the Governor and General Assembly on the Solid Waste Management Act of 1991 Fiscal Year 2002-2003*, January 2004, p. 1.

policy decision, made by all the parties involved when negotiating the reauthorization of the original Solid Waste Management Act. Apparently, the major issue was the lack of Class I landfill space. Many local governments, usually county governments, operated dumps in which all types of waste were disposed. Landfill regulation was fairly new, and many local governments had discovered that meeting the federal and state environmental standards required additional financial investments that they were unwilling or unable to make. They also discovered as the capacity of old landfills ran out, the new regulations made it more difficult to find suitable locations for new landfills. Local governments began to divert some types of waste to Class III/IV facilities to extend the lives of the Class I facilities, which were more expensive to operate. This resulted in the number of Class III/IV facilities increasing while the number of Class I facilities declined.

According to some state officials, private companies began to take advantage of local governments' inability to resolve solid waste issues by entering the landfill business on a larger scale. By striking deals with several local governments to dispose of Class I waste, private operators reduced the cost per ton for disposing of solid waste below what it would cost local governments to operate those facilities. These private operators earned a profit by seeking counties in need of solid waste disposal capacity, offering reduced disposal fees to host counties in exchange for locating large Class I facilities, and charged surrounding counties and other local governments a higher rate to dispose of their waste. The local governments, including those paying the higher rates, found this arrangement to be economically and politically beneficial.²⁶

The result today is almost a complete reversal of the situation prior to the SWMA. In 1989, there were 79 publicly owned municipal solid waste landfills, three publicly owned incinerators, and 17 privately-owned municipal solid waste landfills. Eighty-two of Tennessee's 95 counties operated sanitary landfills. In FY 2002-03, there were only 34 permitted Class I (sanitary) landfills. Nineteen of those were publicly owned. Over the same time, the number of Class III/IV facilities has almost doubled since 1990, to over 70.²⁷

Diversion as a Waste Reduction Tool

The Comptroller's Office of Research listed diversion as a concern in the 1998 report, *Tennessee's Trash in the 1990s, an update*, and although the General Assembly clarified in a 1996 amendment that diverted waste counted toward the reduction goal, it remains a concern today. Some argue that diverted waste should not count as a reduction because it is still disposed of in landfills. Further, Class III/IV facilities are not regulated as strictly as Class I facilities, creating potential for dumping materials, such as toxic or hazardous substances, that could be problematic in the future. Class III/IV facilities are not required to have a liner, required in Class I facilities to prevent leachate from the landfill from

²⁶ Interview with Mike Apple, Director of Solid Waste Management, Tennessee Department of Environment & Conservation, September 25, 2003; Interview with Doug Goddard, Chair of the Municipal Solid Waste Advisory Committee, December 18, 2003.

²⁷ Division of Community Assistance, Tennessee Department of Environment & Conservation, *Annual Report to the Governor and General Assembly on the Solid Waste Management Act of 1991 Fiscal Year 2002-2003*, January 2004, p. 2.

filtering through the ground and potentially contaminating groundwater. One group reported that approximately 0.5 to 1 percent of the total waste stream, including that waste entering Class III/IV facilities, is composed of toxic substances that can contaminate groundwater.²⁸

Overall, concerns with solid waste management in Tennessee focus on efforts to reduce, reuse, and/or recycle solid waste. Despite Class I landfill space exceeding the state's needs, some groups question: (1) whether the state's efforts will continue to prevent the flow of waste into landfills without continued, strong oversight, and (2) whether the state provides the necessary technical and financial assistance to allow local governments to continue successful reduction programs and introduce new efforts. The Tennessee Environmental Council suggests providing drop-off sites for compostable materials, increasing fees for Class I disposal as an incentive to reduce it, and introducing new methods of encouraging businesses to recycle.²⁹ Some point to composting as a vastly underutilized method of waste reduction, as approximately 65 percent of the materials the EPA reported as municipal solid waste in 2001 is compostable.³⁰ Metropolitan Nashville-Davidson County alone reported that trucks hauling municipal waste to a landfill in Rutherford County traveled 591,000 miles.³¹ Composting a percentage of that waste rather than transporting it to the landfill could cut a local government's waste disposal costs.

Hazardous waste disposal is another concern because the state's contractor for mobile collection does not regularly serve all counties. According to DCA's Annual Report for FY2002-2003, 92 counties have participated since 1993, but only 66 one-day collection events were held during the FY2003. Two of those events were in Shelby County. Nashville, Knoxville, and Chattanooga each have permanent collection facilities for household hazardous waste.³²

Intent of Reduction Goal

Various groups disagree over the motivation for setting a 25 percent reduction/diversion goal. Local government representatives maintain that the intent of the act was to address the lack of Class I landfill space and provide local governments with less costly methods of disposing of solid waste than establishing and operating Class I facilities. On the other hand, the act itself declares the policy of the state:

²⁸ Callaway, Will; Executive Director, Tennessee Environmental Council, "Re: solid waste management," E-mail to the author, January 15, 2004; Wood, Bruce, "RE: Analysis of Tennessee 1991 Solid Waste Act," letter to the author, January 29, 2004.

²⁹ Callaway, Will; Executive Director, Tennessee Environmental Council, "Re: solid waste management," E-mail to the author, January 15, 2004.

³⁰ U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, *Municipal Solid Waste in The United States: 2001 Facts and Figures*, October 2003, p. 6; Note: materials listed in this report assumed to be compostable include wood, yard trimmings, food scraps, and paper.

³¹ Metropolitan Government of Nashville and Davidson County, Department of Public Works, Division of Waste Management, *FY2002 Annual Report*, p. 6.

³² Division of Community Assistance, Tennessee Department of Environment & Conservation, *Annual Report to the Governor and General Assembly on the Solid Waste Management Act of 1991 Fiscal Year 2002-2003*, January 2004, p. 4.

“ . . . in furtherance of its responsibility to protect the public health, safety, and well-being of its citizens and to protect and enhance the quality of its environment . . . ”

The act goes on to list an integrated statewide solid waste program and encouraging source reduction, reuse, and recycling as methods to achieve a successful policy, and to:

“educate and encourage generators and handlers of solid waste to reduce and minimize to the greatest extent possible the amount of solid waste which requires collection, treatment, incineration, or disposal through source reduction, reuse, composting, and other methods.”³³

In 1996, the General Assembly authorized another method of reducing Class I waste by allowing diversion of construction and demolition debris, yard wastes, landscaping wastes, and other such materials considered somewhat benign, to Class III/IV landfills.³⁴ Meanwhile, private enterprise realized an opportunity and began operating Class I landfills at a lower cost than local governments could. This virtually solved the problem of a lack of Class I disposal capacity.³⁵

During the first years after implementation of the 1991 law, many local governments invested in recycling programs through grants and technical assistance. Their investments included convenience centers where residents could drop off recyclables as well as household trash and other materials, curbside recycling, balers used to compact cardboard for shipment to recyclers, bins in which to collect recyclables, trucks to transport recyclables, and other equipment. The state invested funds and effort to educate residents and encourage waste reduction and recycling in addition to technical assistance to businesses and industries to help start private waste reduction programs. The state and local governments invested effort to find markets for recyclables and reusable materials. Even with financial assistance, the entry of private enterprise into the landfill business helped keep Class I disposal costs lower than anticipated, in some instances making Class I disposal appear more cost effective than recycling. Local governments have also reported they have no direct control over their waste streams. The decision to recycle lies with residents despite government’s efforts to educate residents, promote recycling, and provide the opportunity to recycle.³⁶ Aside from penalties ranging from \$1,000 to \$5,000 per day after 180 days of noncompliance,³⁷ local governments have little incentive to begin new waste reduction programs or expand others.

However, there are additional reasons to reduce Class I waste. Leaders of environmental groups point out that even with strict regulation, Class I landfills pose a risk of contaminating groundwater. Landfill disposal of wet food wastes also creates methane

³³ Public Acts, 1991, Chapter No. 451.

³⁴ Public Acts, 1996, Chapter No. 846.

³⁵ Interview with Doug Goddard, Chair of the Municipal Solid Waste Advisory Committee, December 18, 2003.

³⁶ Ibid.

³⁷ §68-211-861(e), *Tennessee Code Annotated*, §68-211-816(a)(3), *Tennessee Code Annotated*.

gas, which can become an air quality issue or fire hazard. In some instances, gas from closed landfills is used as a fuel to produce electricity.³⁸ Much of the waste in Class I facilities deteriorates slowly, or not at all, and will remain in the landfill for a long time, potentially creating problems well into the future. Costs for transporting waste to regional facilities and the pollution caused by the trucks hauling this waste are also concerns. Materials disposed of in Class III/IV facilities can contain toxic substances, another potential source of groundwater contamination, while many of these materials can be recycled into mulch, composted, or reused for other purposes. Protecting the environment is a motivation for continuing the waste reduction goal, tipping fee surcharge, and tire pre-disposal fees to increase waste reduction, reuse, and recycling efforts across the state.

Local Solid Waste Data

Local governments collect solid waste data inconsistently from county to county.

Also, the Division of Community Assistance does not independently verify the accuracy of the data reported, although it investigates apparent discrepancies. The resulting data provides division staff with an idea of solid waste disposal and waste reduction activities, but not a reliable waste reduction rate. Counties collect this data from a number of sources and report to solid waste management regions. However, the counties do not all collect the same data. Some collect data only from government-affiliated or regulated facilities such as landfills, transfer stations, and convenience centers. Other counties also survey private entities such as manufacturing plants, small businesses, and other industries to determine the amount of recycling/reduction/reuse activities in the private sector. Some private entities provide this information voluntarily, while others do not. DCA has no authority to force private entities to report this data, and data provided voluntarily is not subject to verification. Class I (municipal solid waste) disposal is the most reliable data available because the statute requires Class I facilities to maintain scales to weigh the waste entering the facilities, record, and report this information to the Division of Community Assistance. Solid waste regions compile additional data into Annual Progress Reports. These reports include, in addition to the volume of waste disposed of in Class I facilities, any additional information counties might collect.³⁹

County officials must sign reports to vouch for their accuracy, and regional boards review data and certify its accuracy prior to submitting reports to DCA. DCA staff members review these reports, comparing them to previous years for large variances that might indicate reporting problems or other reasons for differences. The statute requires Class I facilities to maintain scales to weigh waste entering the facilities. Class III/IV facilities estimate the *volume* rather than the weight of materials entering the facilities.⁴⁰

Other states and the EPA have been unable to find an ideal way of ensuring good waste reduction data. The EPA does not use state-collected data to estimate solid waste

³⁸ Metropolitan Government of Nashville and Davidson County, Department of Public Works, Division of Waste Management, *FY2002 Annual Report*, p. 1.

³⁹ Interview with Ron Graham, Director of Community Assistance, Tennessee Department of Environment & Conservation, December 2, 2003; Interview with Mike Apple, Director of Solid Waste Management, Tennessee Department of Environment & Conservation, September 25, 2003.

⁴⁰ Interview with Mike Apple, Director of Solid Waste Management, Tennessee Department of Environment & Conservation, September 25, 2003.

disposal, recycling, reduction, and other information. Instead, the agency contracts with a company, Franklin & Associates, to produce an annual waste characterization report which uses a materials flow methodology based on production data for the materials and products in the waste stream.⁴¹ To estimate waste generation data, the company makes specific adjustments to the production data by each material and product category and adjust for imports, exports, and diversions from municipal solid waste (e.g., for building materials made of plastic and paperboard that become construction and demolition debris). The company also adjusts for the lifetimes of products, and finally, accounts for food wastes, yard trimmings, and a small amount of miscellaneous inorganic wastes by compiling data from a variety of waste sampling studies.⁴²

The statute establishing the 25 percent reduction goal (TCA §68-211-861) provides that if a region does not meet the goal, TDEC will “objectively assess the activities and expenditures of the region and the local governments in the region to determine whether the region’s program is qualitatively equivalent to other regions that meet the goal and whether the failure is due to factors beyond the control of the region.” So, the data reported outside of waste disposed of in Class I facilities should only be used for qualitative assessment if the region does not meet the Class I solid waste reduction goal. Because Class I disposal facilities in the state are required to weigh waste entering the facilities with scales, this data is the most reliable waste reduction data available. As established in the law, this data should be the primary determinant of whether solid waste management regions have met the goal. However, the General Assembly, the department, and the public need to have some level of confidence in the reliability of additional data used for qualitative assessments.

Getting the Numbers

Division of Community Assistance staff report that they, along with regional authorities, and local governments, have used resources to get a more accurate representation of waste reduction when those resources could be used to support local waste reduction or recycling efforts. DCA management could not quantify the resources used trying to determine an accurate waste reduction number, but listed a number of activities state and local officials have engaged in to gather, review, compile, store, retrieve, report and explain the data they can collect. Some feel that if the state focuses on this waste reduction number that local governments have little direct power to enforce, some local governments might simply abandon good programs that cost more than sending waste to a landfill.⁴³ DCA and local governments, in trying to obtain better solid waste information, engage in activities that consume resources -- administrative staff time, field staff time visiting industries and investigating discrepancies in information, and other activities. In addition, the division spent \$127,330 on salaries and benefits to conduct a survey of industrial recycling in 15 counties scattered throughout the state to evaluate

⁴¹ Phone interview with Pamela Swingle, Environmental Scientist, RCRA Programs Branch, EPA Region 4, Atlanta, January 6, 2004.

⁴² Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, *Municipal Solid Waste in the United States: 2001 Facts and Figures*, October 2003, pp. 18-19.

⁴³ Interview with Doug Goddard, Chair of the Municipal Solid Waste Advisory Committee, December 18, 2003; Interview with Ron Graham, Director of Community Assistance, Tennessee Department of Environment & Conservation, December 2, 2003.

industrial participation in waste reduction activities and point out ways to reduce waste at the source.⁴⁴ DCA management favors using those resources to provide local governments the means to continue and improve their programs, educate the public and local officials, and identify local waste streams and opportunities for waste reduction and recycling. According to DCA management, local governments also need to better report the cost avoidance created through reducing Class I facility disposal by reducing, diverting, and recycling waste, rather than simply reporting the increased cost associated with recycling compared to landfilling waste.⁴⁵

Solid Waste Assistance Programs

The Division of Community Assistance administers the solid waste assistance programs, including grants intended to help local areas manage problem waste and achieve the waste reduction goal in the SWMA. Appendix D lists the available grants and funding for each.

Measuring Grant Results

The Division of Community Assistance does not examine waste reduction related to grants. As a result, local grant recipients may not direct grant funds to purposes that most effectively help Tennessee meet the waste reduction/diversion goal in the act. DCA gets an idea of the effectiveness of grants through the Annual Progress Reports (APR's) submitted by each Solid Waste Management Region. These reports break down solid waste data by county government, so it is possible to get an idea of the impact of each grant awarded over time, or at least since 1999, when DCA staff began entering reported data into the database (keeping in mind the limitations of solid waste reduction data detailed in the section titled Local Solid Waste Data). Division staff have also entered key data from 1989 and 1995 so the division can estimate waste reduction during that time, though division management consider the earlier data inadequate for determining local progress toward meeting the 25 percent reduction/diversion goal. Staff members have also conducted numerous site visits over the years to examine the infrastructure and programs in place at the local level.⁴⁶

DCA staff compare data from year-to-year but do not specifically look for increases in recycling or solid waste reductions directly related to grants. Rather, they look for a region's total programs, total solid waste generation, methods employed to achieve the 25 percent goal, diversion rates to Class III/IV facilities, and other data to evaluate a total regional program. DCA management reports there are so many factors that determine whether individuals and businesses participate in recycling programs other than grants, it would be difficult to measure the impact of individual grant awards. The division

⁴⁴ Graham, Ron, "Re: Need some more info on reduction/diversion goal," E-mail to the author, January 7, 2004; Phone interview with Louis Bordenave, Manager of Planning, Reporting, and Waste Reduction, Division of Community Assistance, Tennessee Department of Environment & Conservation, January 29, 2004.

⁴⁵ Interview with Ron Graham, Director of Community Assistance, Tennessee Department of Environment & Conservation, December 2, 2003.

⁴⁶ Interview with Joyce Dunlap, Manager, Solid Waste Assistance Programs, Community Assistance Division, Tennessee Department of Environment & Conservation, December 9, 2003.

evaluates the programs in place based on the local and regional efforts, while the grants help provide residents the opportunity to participate.⁴⁷

Local governments' reductions in solid waste, leading to compliance with the act's goal, should be the criteria by which DCA and the MSWAC evaluate the effectiveness of grant awards. Also, the Tennessee Governmental Accountability Act of 2002, which will extend to all state agencies by FY2011-12, requires performance measures for each program, including:

- Outputs produced by the programs,
- Outcomes resulting from the programs,
- Baseline data associated with each performance measure, and
- Performance standards.⁴⁸

The department could begin developing these measures for the various grant programs now, so that DCA management could adjust them if initial measures do not accurately and objectively reflect the efforts and accomplishments of regional authorities and local governments.

Old, Unlined Landfills

Old, unlined landfills pose an unknown contamination risk to Tennessee's groundwater resources. Groundwater contamination from old, unlined landfills has become a greater concern since Dickson County authorities discovered toxic contaminants in private wells. Industries in the area buried toxic waste in the Dickson County landfill before the state enacted regulations in the 1970s. While the Division of Solid Waste Management has begun limited assessments of landfills that had been permitted and were closed, many old Tennessee landfills were in operation for years before the state and federal governments began regulating the types of waste allowed. Most private well owners in the state have never had their water tested for such toxic contaminants. Tennessee requires testing only for public water supplies. TDEC does not test well or groundwater near old pre-permit landfills unless, after being notified, there is a reason to do so, such as infiltration of runoff into an old dump, erosion of an old dump's boundary, or some other deterioration.⁴⁹ The department also does not use information they already have to assess the risk of groundwater contamination near old dumps, but uses Division of Water Supply groundwater test results to determine potential problems.

A former automotive manufacturing plant buried drums of industrial waste, including solvents containing trichloroethylene, or TCE, at the Dickson landfill from 1968 through 1973. The federal Agency for Toxic Substances and Disease Registry lists TCE as

⁴⁷ Ibid.

⁴⁸ Public Acts, 2002, Chapter No. 875.

⁴⁹ Interview with David Draughon and Tom Moss, Division of Water Supply, Tennessee Department of Environment & Conservation, December 10, 2003; Interview with Mike Apple, Director of Solid Waste Management, Tennessee Department of Environment & Conservation, November 26, 2003.

potentially causing heart and nervous system damage, birth defects and cancer, particularly of the prostate, cervix, kidneys, liver and lungs. Small amounts may cause nausea, dizziness and skin rashes. In 1997, TCE contamination forced closure of a well that had provided some of the city and county's water supply since the 1980s.⁵⁰ However, property owners who use well water as their drinking water are responsible for monitoring the water's safety.

Before state regulators adopted landfill regulations in 1973, local landfills commonly accepted industrial waste. Almost every county in the state has an old landfill. According to the director, the Division of Solid Waste Management has records of about 98 percent of the approximately 120 Tennessee landfills created before 1972 and closed according to standards of the time. Regulators report they occasionally find old, unreported landfills. Department staff report that by examining old local and state records, they could determine the industries existing in those areas when old dumps were active and make an educated guess as to what might have been dumped at these facilities.⁵¹ However, though the division has begun limited assessments of permitted facilities closed before 1990, they have not examined dumps closed before permitting began.

The Florida Department of Environmental Protection, on the recommendation of the Florida Office of Program Policy Analysis and Government Accountability, surveyed its districts to determine whether there was concern for groundwater contamination at any of its 410 known closed, unlined landfills. The survey revealed that district staff had continuing concerns with 71 of the closed facilities, and the department conducted groundwater testing at 20 of those. Ten of the 20 old facilities tested had known problems with groundwater contamination.⁵² Tennessee has conducted no such assessments or testing near old dumps, except where citizens, local governments, or others reported problems or there were other indications that contamination might be a problem.

Legislative Recommendation:

The General Assembly may wish to re-examine the intent of setting a 25 percent reduction/diversion goal when considering the next reauthorization. If maintaining adequate capacity to dispose of solid waste into the future is its sole motivation, the General Assembly could repeal the 1991 law and its 25 percent reduction/diversion goal. The Legislature would then let the market dictate how and where local governments and regional authorities dispose of solid waste. However, if the law is intended to protect human health and the environment, legislators should consider the costs in financial and environmental terms, decide how much the state is willing to spend for environmental protection, and how much risk the state is willing to accept with regard to solid waste.

⁵⁰ Edwards, Holly, "Family Blames Health Woes on Dickson's Landfill," *The Tennessean*, Tuesday, September 2, 2003, accessed online 9/2/03.

⁵¹ Interview with Mike Apple, Director of Solid Waste Management, Tennessee Department of Environment & Conservation, November 26, 2003.

⁵² Office of Program Policy Analysis and Government Accountability, an office of the Florida Legislature, *OPPAGA Progress Report: Closed Landfills Pose Limited Risk to Ground Water, But Need Monitoring*, June 2000, pp. 1&3.

The General Assembly may wish to examine these issues more closely over the next four years and consider additional requirements at the act's next reauthorization.

Administrative Recommendations:

The Division of Community Assistance should continue to focus on per capita reductions in Class I solid waste disposal, and provide solid waste regions and local governments the technical assistance they need to develop more accurate and complete solid waste management information.

The Division of Community Assistance should develop methods of measuring the effectiveness of local governments' uses of grant funds to achieve the solid waste reduction/diversion goal in the law. Examples of such measurements might be:

- The grant provided additional capacity to process recyclables.
- The grant resulted in additional recyclables collected through a new or expanded curbside recycling program.
- The grant improved the ratio of the number of convenience centers to the number of households.
- The grant helped establish ongoing recycling curricula and programs in classrooms, resulting in additional waste reductions.
- The grant ultimately resulted in a reduction in per capita waste disposed in Class I facilities.

The Department of Environment and Conservation should develop a plan to seek funding and begin to gather information on old, unlined landfills to characterize the risk of groundwater contamination in their vicinity. TDEC should also develop a plan/policy to deal with such contamination when the department discovers significant risk. The department should base assessments on historical documentation of materials that might have been dumped, the use of private wells for drinking water in the area, and the geology underlying the old landfills.

Appendix A

2004 Update to Conclusions and Alternatives from *Tennessee's Trash in the 1990s, an update*; July 1998

1998 Conclusion	2004 Update
All regions have now submitted 10-year solid waste plans and the Department of Environment and Conservation has approved them.	This issue has been resolved. ⁵³
As a whole, the state has not yet achieved the 25 percent waste reduction goal.	This issue remains a concern; see pages 7-10.
The regions' waste reduction calculations may not be accurate in all cases.	This issue remains a concern; see pages 12-14.
The department still allows waste diversion from Class I disposal facilities to Class III and IV facilities.	The General Assembly clarified diversion as a legal waste reduction tool through Public Chapter 846 in 1996, but the issue remains a concern to some groups; see page 9-10.
Some counties still allow waste disposal in "green boxes," a practice that does not further the goals of the Solid Waste Management Act.	While the issue remains a concern, the state has made significant progress eliminating "green boxes." See page 7.
The department has formed a Waste Reduction Task Force to examine alternatives to the 25 percent waste reduction goal.	The 1999 amendments to the act maintained the 25 percent reduction goal, according to §68-211-861, <i>Tennessee Code Annotated</i> .
The department has begun implementing the tasks and activities set out in the Solid Waste Adult Education Framework adopted by the Municipal Solid Waste Advisory Committee.	This was a project to provide local governments with a guidebook of adult education opportunities. The distribution of this guidebook was a project that was completed. Under TCA § 68-211-842 adult education was prescribed to be funded through FY 1998-99. ⁵⁴
Despite the efforts of the Division of Solid Waste Assistance and the Solid Waste Advisory Committee, some regions appear to be making slow progress toward developing effective solid waste public education programs.	UT's Waste Management Research and Education Institute has taken the lead in Community Solid Waste Education through its Tennessee Solid Waste Education Project (TN-SWEP), focusing on K-12 students. ⁵⁵

⁵³ Division of Community Assistance, Tennessee Department of Environment & Conservation, *Annual Report to the Governor and General Assembly on the Solid Waste Management Act of 1991 Fiscal Year 2002-2003*, January 2004, p. 3.

⁵⁴ *Ibid.*, p. 5.

⁵⁵ *Ibid.*, p. 5.

Appendix A (cont.)

1998 Conclusion	2004 Update
<p>Since 1995-96, the department has contracted with the University of Tennessee's Waste Management Research and Education Institute to carry out the K-12 educational directives in T.C.A. 68-211-845. However, the law still designates the Department of Education as the agency required to fulfill the provisions.</p>	<p>The 1999 amendments to the act (Public Chapter 384) resolved this issue.</p>
<p>The department has not developed a means of evaluating its solid waste education efforts.</p>	<p>This issue remains a concern; see pages 14-15.</p>
<p>The department has shifted its focus to recycling waste tires rather than landfilling. However, only 36 counties elected to participate in the tire recycling program in FY1997-98.</p>	<p>The 1999 Amendments prohibit disposal of shredded tires in landfills after July 1, 2002. Also, see page 6.</p>
<p>The Division of Solid Waste Assistance has improved its tracking of disposed tires to curb illegal tire dumping and to assist with record-keeping for the Waste Tire Option Program.</p>	<p>See additional information on page 6.</p>
<p>Most, but not all, counties have established enterprise accounting funds for disposal facilities.</p>	<p>Office of Research staff did not revisit this issue while conducting research for this report.</p>
<p>The solid waste management and planning database is still not functional as required by T.C.A. 68-211-872.</p>	<p>The database is functional, but data problems persist. See pages 12-14.⁵⁶</p>

Alternatives

The report provided both legislative and administrative alternatives summarized below.

1998 Alternative	2004 Update
Legislative Alternatives	
<p>The General Assembly may want to request that the Municipal Solid Waste Advisory Committee provide a recommendation concerning the waste reduction goal in the Solid Waste Management Act.</p>	<p>The 1999 amendments to the act continued the 25 percent reduction and diversion goal.</p>

⁵⁶ Interview with Joyce Dunlap, Manager, Solid Waste Assistance Programs, Community Assistance Division, Tennessee Department of Environment & Conservation, December 9, 2003.

Appendix A (cont.)

1998 Alternative	2004 Update
<p>The General Assembly may want to amend T.C.A. 68-211-851(d), placing a limit on the number of “green box” receptacles a county is allowed, or phasing them out completely over a period of time.</p>	<p>§68-211-851, <i>Tennessee Code Annotated</i> prohibits counties from establishing “green boxes” that were not in use before January 1, 1996.</p>
<p>The General Assembly may want to revise T.C.A. 68-211-845, which currently requires the Department of Education to carry out K-12 education directives for solid waste. The General Assembly may want to revise the language either to require the current contractor, University of Tennessee Waste Management Research and Education Institute, to carry out the directives or to allow TDEC to determine how to fulfill them.</p>	<p>The 1999 amendments to the act (Public Acts, chapter 384, 1999; §68-211-845, <i>Tennessee Code Annotated</i>) designated University of Tennessee’s Waste Management Research and Education Institute as the agency required to fulfill these provisions.</p>
<p>Administrative Alternatives</p>	
<p>The department should develop a means of evaluating both its adult education program and the K-12 program that they contract with UTWMREI.</p>	<p>This issue remains a concern. DCA reports on the number of classroom presentations, in-service training sessions, curriculum workshops, meetings with local officials, and other activities, but has not developed a method of evaluating the effectiveness of these efforts.⁵⁷</p>
<p>The department should continue to foster an infrastructure that will encourage the recycling of waste tires in the state.</p>	<p>The division continues to use grants, technical assistance, and other methods to foster infrastructure to make waste reduction opportunities available to Tennessee residents.</p>

⁵⁷ Division of Community Assistance, Tennessee Department of Environment & Conservation, *Annual Report to the Governor and General Assembly on the Solid Waste Management Act of 1991 Fiscal Year 2002-2003*, January 2004, p. 5.

Appendix B

Solid Waste Management Act Review Task Force Recommendations

- #1** Seek reauthorization of the state surcharge fee on municipal solid waste disposed of at Class I solid waste disposal facilities.
- #2** Repeal required five-year updates to ten-year regional solid waste management plans, and place a ten-year horizon on Annual Progress Reports that are already required.
- #3** Continue the 25 percent waste reduction and diversion goal.
- #4** Require all state facilities and institutions to develop and implement a waste reduction plan (includes recycling, source reduction, problem waste diversion, composting and mulching of MSW, and diversion to Class III/IV disposal facilities), and include enforcement for non-compliance.
- #5** Make all counties, metropolitan governments, and incorporated municipalities accountable to the provisions of the law by requiring that each county have a planning board to approve the annual MSW progress report and annual MSW plan update.
- #6** Require that waste haulers (those that charge a fee for service and haul more than just their own generated waste) doing business in Tennessee be licensed and accurately report amounts of waste collected by government unit.
- #7** Require that development districts write regional plans as needed and compile a district solid waste management plan.
- #8** Increase household hazardous waste collection events for counties with high participation rates.
- #9** Provide funding for each county to hire a qualified person for solid waste management.
- #10** Establish a total waste tire management program for state and local governments.

Appendix C County/Regional Waste Reduction Rates, 2002

County	1995 Tons Per Capita	2002 Tons Per Capita	% Reduction	County Meets 25%
Cocke	1.3121	0.4238	67.7%	Yes
Putnam	2.0502	0.6709	67.3%	Yes
Sumner	1.8087	0.6643	63.3%	Yes
Grainger	0.9996	0.3742	62.6%	Yes
Henderson	1.4995	0.5634	62.4%	Yes
Henry	0.9983	0.3971	60.2%	Yes
Sevier	1.8045	0.7767	57.0%	Yes
Blount	1.6103	0.6999	56.5%	Yes
Claiborne	0.8420	0.3698	56.1%	Yes
Loudon	3.0507	1.4191	53.5%	Yes
Roane	1.2362	0.6562	46.9%	Yes
Van Buren	0.3158	0.1695	46.3%	Yes
Madison	2.1885	1.2033	45.0%	Yes
Davidson	1.6014	0.9015	43.7%	Yes
Cheatham	0.5708	0.3301	42.2%	Yes
Green	1.2799	0.7893	38.3%	Yes
Hancock	0.4869	0.3051	37.3%	Yes
Perry	0.9514	0.6179	35.1%	Yes
Hardeman	1.0706	0.7066	34.0%	Yes
Carroll	1.0769	0.7338	31.9%	Yes
Scott	0.8109	0.5752	29.1%	Yes
Cumberland	0.9982	0.7089	29.0%	Yes
Knox	1.2850	0.9378	27.0%	Yes
Haywood	0.8646	0.6333	26.8%	Yes
Hamblen	2.2050	1.6440	25.4%	Yes
Lawrence	0.9426	0.7031	25.4%	Yes
Sullivan	1.6279	1.2179	25.2%	Yes
Wilson	0.8968	0.6745	24.8%	No
White	0.9705	0.7307	24.7%	No
Dekalb	1.0341	0.7805	24.5%	No
Hawkins	1.1190	0.8593	23.2%	No
Monroe	0.8342	0.6427	23.0%	No
Lauderdale	1.0294	0.8007	22.2%	No
Lewis	0.7800	0.6130	21.4%	No
Humphreys	1.2865	1.0169	21.0%	No
Jefferson	0.7168	0.6054	15.5%	No
Decatur	0.6264	0.5402	13.8%	No
Houston	0.5052	0.4547	10.0%	No
Tipton	0.9765	0.8839	9.5%	No
Jackson	0.4701	0.4256	9.5%	No
Fentress	0.5804	0.5575	3.9%	No
Dickson	0.7615	0.7328	3.8%	No
Shelby	1.7984	1.7842	0.8%	No
Union	0.5325	0.5306	0.4%	No
Anderson	0.9918	0.9891	0.3%	No

Appendix C (cont.)

County	1995 Tons Per Capita	2002 Tons Per Capita	% Reduction	County Meets 25%
Hickman	0.4132	0.4328	-4.7%	No
Bedford	0.8754	0.9400	-7.4%	No
Campbell	0.3635	0.4095	-12.7%	No
Williamson	0.7696	0.8890	-15.5%	No
Clay	0.4967	0.5915	-19.1%	No
Morgan	0.4835	0.5996	-24.0%	No
Benton	0.6633	0.8247	-24.3%	No
Overton	0.4111	0.5157	-25.4%	No
Fayette	0.4377	0.5692	-30.0%	No
Pickett	0.4012	0.5892	-46.9%	No
Moore	0.2705	0.4551	-68.2%	No
STATE	1.3099	1.0446	20.3%	No
Region	1995 Tons Per Capita	2002 Tons Per Capita	% Reduction	Region Meets 25%
CDG	0.971	0.6231	35.8%	Yes
Gibson	By Region	0.4977		N/A
Dyer	By Region	0.9543		N/A
Crockett	By Region	0.1963		N/A
North Central	0.668	0.4489	32.8%	Yes
Smith	By Region	0.4877		N/A
Trousdale	By Region	0.4521		N/A
Macon	By Region	0.4140		N/A
Interlocal	1.179	0.8814	25.2%	Yes
Franklin	By Region	0.7509		N/A
Giles	By Region	0.7906		N/A
Lincoln	By Region	0.6815		N/A
Marshall-Maury	1.8509	1.4448	21.9%	No
Maury	By Region	1.5502		N/A
Marshall	By Region	1.1691		N/A
Shiloh	0.5832	0.5415	7.2%	No
McNairy	By Region	0.3668		N/A
Chester	By Region	0.3522		N/A
Hardin	By Region	0.8202		N/A
Wayne	By Region	0.5494		N/A
M-R-S	0.7247	0.6825	5.8%	No
Stewart	By Region	0.5123		N/A
Robertson	By Region	0.5246		N/A
Montgomery	By Region	0.7638		N/A
Central	1.0364	1.0476	-1.1%	No
Warren	By Region	0.7216		N/A
Rutherford	By Region	1.2243		N/A
Coffee	By Region	0.7629		N/A
Cannon	By Region	0.4572		N/A

Appendix C (cont.)

Region	1995 Tons Per Capita	2002 Tons Per Capita	% Reduction	Region Meets 25%
LOW	0.8967	0.9687	-8.0%	No
Weakley	By Region	0.5090		N/A
Obion	By Region	1.5124		N/A
Lake	By Region	0.7265		N/A
Southeast	1.2279	1.3635	-11.0%	No
Bledsoe	By Region	0.2156		N/A
Hamilton	By Region	1.7261		N/A
McMinn	By Region	1.0834		N/A
Sequatchie	By Region	0.2300		N/A
Polk	By Region	0.4396		N/A
Rhea	By Region	0.8970		N/A
Bradley	By Region	1.3086		N/A
Meigs	By Region	0.4105		N/A
Grundy	By Region	0.4091		N/A
Marion	By Region	0.9064		N/A
Northeast	0.8187	1.0112	-23.5%	No
Carter	By Region	0.6385		N/A
Washington	By Region	1.3070		N/A
Unicoi	By Region	0.9390		N/A
Johnson	By Region	0.4642		N/A

Source: Division of Community Assistance, Tennessee Department of Environment and Conservation

Appendix D

Solid Waste Assistance Program Grants

Grant	Description/Available Funding
Recycling Equipment	\$400,000 set aside; maximum \$25,000 grants to purchase key recycling equipment and requiring a local match of 15-50 percent. A team of three or more raters evaluates each grant application, and the average of the three scores becomes the final score. Grant recipients are required to submit bid packages before purchasing equipment, and staff conducts site visits to verify that equipment is delivered, installed, and operational prior to making payment.
Recycling Rebates	\$600,000 set aside for the 11 counties that generate the most solid waste. DCA allocates funds based on population, and requires a dollar-for-dollar match. Cities within these counties are also eligible if they provide collection and disposal services. Recipients must submit an application outlining how they plan to use the funds, and may use funds for any recycling purpose.
Development Districts	\$450,000 set aside; maximum \$50,000 per district. Districts must submit a work plan and estimated budget, and are required to submit quarterly reports of activities along with an invoice of work completed to receive reimbursement.
Waste Tires	\$4.3 million set aside; DCA offers grants to counties at the beginning of the fiscal year based on the projected waste tire stream. Counties can request increases if they can justify the need and funds are available. Payment requests must include manifests and weight scale invoices while DCA staff use a waste tire database to monitor eligible tires by comparing tires disposed of with predisposal fees paid by tire dealers from a Department of Revenue database. Ninety-four total counties participate, with 91 counties receiving grant funds (some counties handle tires for neighboring counties and receive grant funds for those counties).
Waste Reduction	\$4 million set aside for this new grant; maximum grant is \$200,000, with a local match of 10-50 percent required. Local waste authorities may use funds for a variety of purposes, including constructing new facilities, upgrading facilities and programs, purchasing equipment, computers, and software. Applicants may request education funding for up to 15 percent of the total grant amount. DCA scores applications similar to Recycling Equipment Grant applications. To receive payment, recipients must submit bid packages for equipment purchases and construction-related activities, and DCA technical staff will conduct onsite verification. DCA has received 43 applications for these grants, demonstrating over \$9 million in needs.
Used Oil	No funds have been set aside for this program this year due to budget constraints for the last three years and few underserved areas in the state. DCA expects to solicit applications in late January or February, and local authorities may use funds to establish a used oil collection site, purchase equipment, and provide public education.

Source: Division of Community Assistance, Tennessee Department of Environment & Conservation, *Grant Summary*, December 9, 2003, pp. 1-2.

Appendix E
TDEC Response

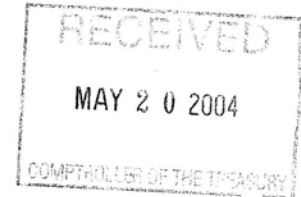


STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
NASHVILLE, TENNESSEE 37243-0435

BETSY L. CHILD
COMMISSIONER

PHIL BREDESEN
GOVERNOR

May 19, 2004



The Honorable John G. Morgan
Comptroller of the Treasury
First Floor, State Capitol
Nashville, TN 37243

Re: Review of the Implementation of the Solid Waste Management Act of 1991

Dear Mr. Morgan:

This letter is to acknowledge that your office shared with the Tennessee Department of Environment and Conservation a draft report in the above-referenced matter. We provided comments and had discussions with your staff regarding the draft. Revisions were made in response to some of our comments and discussions. We appreciate the opportunity for input provided to us by your office during this process.

On behalf of my staff, I would like to compliment your staff members, who performed the review, on the professional manner in which they conducted themselves. We welcome their input and independent analysis of our operation in hopes that through their efforts our Department's operations will be improved.

If you have any questions, please contact Karen H. Stachowski, Deputy Commissioner, at 532-0124.

Sincerely,

A handwritten signature in black ink, appearing to read "B. Child".

Betsy L. Child

BLC:KHS

Cc: Karen Stachowski
Ron Graham
Alan Leiserson

Offices of Research and Education Accountability Staff

Director

◆Ethel Detch

Assistant Director (Research)

◆Douglas Wright

Assistant Director (Education Accountability)

Jason Walton

Principal Legislative Research Analysts

◆Phillip Doss

◆Kim Potts

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Emily Wilson

Associate Legislative Research Analysts

◆Bonnie Adamson

Brian Doss

Kevin Krushenski

Russell Moore

Bintou Njie

Sonya Phillips

Executive Secretary

◆Sherrill Murrell

◆indicates staff who assisted with this project