Minnesota Office of **Environmental Assistance**

2003 Solid Waste Policy Report

A VISION FOR SOLID WASTE MANAGEMENT

JANUARY 2004

Students from the School of Environmental Studies and Office of Environmental Assistance staff sort through a pile of trash to learn more about the complexities of solid waste — what's recyclable, what's organic (compostable), and the challenges in separating it.

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The total cost of preparing the Solid Waste Policy Report, including staff time, writing, editing and printing was $89,000

OEA reports are printed on 100 percent post-consumer recycled paper manufactured without chlorine or chlorine derivatives (PCF)

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Summary

This is the eighth biennial *Solid Waste Policy Report* to the Minnesota Legislature by the Office of Environmental Assistance (OEA). The Waste Management Act (WMA) requires the Director of the OEA to submit the report every two years to the Minnesota Legislature, Minn. Stat. § 115A.411 (2000). The purpose of this report, as specified in the WMA, is to:

- Summarize the current status of solid waste management in Minnesota.
- Evaluate the extent and effectiveness of programs in accomplishing state policies and goals.
- Identify issues requiring further research and action and make recommendations for establishing or modifying the state's solid waste management policies and programs.

Every *sixth year*, the policy report must be expanded to include:

- The *Metropolitan Solid Waste Management Policy Plan* as required in Minn. Stat. § 473.149.[1]
- Strategies for the office to advance the goals of the WMA, to manage waste as a resource, to further reduce the need for expenditures on resource recovery and disposal facilities, and to further reduce long-term environmental and financial liabilities.

State waste management policy is based on the WMA, Minn. Stat. § 115A. Full versions of the state statutes, session laws, and rules can be found online on the Minnesota State Legislature web site: www.leg.state.mn.us/leg/statutes.htm.

Framework and vision

The policy report is based on state solid waste policy according to state statute, the principles of *waste as a resource*, and recommendations of the State Solid Waste Advisory Committee.

State solid waste policy

The goal of the WMA (Minn. Stat. § 115A.02a) is to foster an integrated waste management system in a manner appropriate to the characteristics of the waste stream, and thereby protect the environment and public health. The WMA ranks waste management practices in the following order of preference:

1. Waste reduction and reuse.
2. Waste recycling.
3. Composting of yard waste and food waste.
4. Resource recovery through mixed municipal solid waste composting or incineration.
5. Land disposal which produces no measurable methane gas or which involves the retrieval of methane gas as a fuel for the production of energy to be used on-site or for sale.
6. Land disposal that produces measurable methane but does not involve the retrieval of methane gas as a fuel for the production of energy to be used on-site or for sale.

[1] The *Metropolitan Solid Waste Policy Plan*, prepared by the OEA and the metropolitan Solid Waste Management Coordinating Board, 2003, is published separately.

Waste as a resource

This policy report has as an overarching theme: treating waste as a resource. This concept is based on the following principles of sustainability and resource conservation:

- **Treating waste as a resource reduces pollution.** Shifting waste management practices toward those that better manage waste as a resource, such as waste reduction, reuse, recycling, or composting, leads to reductions in the amount of pollution released to the environment, including greenhouse gases.
- **Reducing waste saves money and creates jobs.** Reducing and eliminating the generation of waste often creates significant cost savings by conserving raw materials and using resources more efficiently in the production of products.
- **Materials in waste often have value.** If certain materials are separated prior to disposal, these materials can be reused, recycled, or recovered for their highest and best use. For example, the organic portion of garbage can be kept separate in one's kitchen before it gets to the curb, and then processed into compost, which can be used as a high-quality soil amendment. As seen in the city of Hutchinson, this can bring money and jobs back to the local community.

Vision for managing Minnesota's solid waste

In 2003, the State Solid Waste Advisory Committee developed a vision and goals for solid waste management in Minnesota.

Vision

A sustainable community seeks a better quality of life for current and future residents by maintaining nature's ability to function over time. It minimizes waste, prevents pollution, promotes efficiency, and develops resources to revitalize local economies. The waste management system is a component of the infrastructure of a sustainable community. Therefore, solid waste will be managed by technologies and methods that support sustainable communities and environments. The solid waste hierarchy, with its associated goal of protecting the state's land, air, water, and other natural resources and the public health, is central to attaining the objectives of sustainability and solid waste management.

Goals

1. To manage waste in a manner that will protect the environment and public health and that will conserve resources.
2. To manage waste in an integrated waste management system in accordance with the hierarchy in order to minimize landfilling, with an increased focus on maximizing reduction, reuse, recycling, and source-separated composting.
3. To manage waste in a cost-effective manner that accounts for environmental benefits and that minimizes the long-term financial liability for citizens, businesses, and taxpayers.
4. To cause generators to take responsibility for the environmentally sound management of their waste and to allocate solid waste management system costs equitably among those who use or benefit from the system.
5. Ensure accurate and complete accounting of all data, i.e., waste generation, disposal, recycling, reuse, revenues, and expenditures.
6. Maximize the use and value of recovered materials.

Status, extent, and effectiveness of solid waste programs

Increasing waste generation poses challenges and opportunities for Minnesota

In 2002, Minnesota generated nearly 5.9 million tons of mixed municipal solid waste (MSW). Over the last 10 years, MSW generation increased at an average rate of 3.7 percent each year and the per capita MSW generation increased at an average rate of 2.5 percent each year. Despite a statutory goal (Minn. Stat. §115A.55, subd. 4) to reduce the per capita MSW generation 10 percent by the year 2000 from 1993 levels, the per capita generation increased by 32 percent over that time period.

Looking at future MSW generation, the projections show that MSW generation will steadily increase from 5.9 million tons in 2002 to 9.1 million tons in 2015. High MSW generation and high growth in MSW generation will continue to be concentrated in the Twin Cities region, in regional centers such as Rochester and St. Cloud, and in Minnesota's lake regions along U.S. Highways 169 and 371 and Interstate 94. MSW growth is less pronounced in other areas of the state.

Continued waste growth will put pressure on the capacity of the waste collection and management infrastructure, particularly in these high growth areas, and it may also result in more landfilling. Notwithstanding, there is a high percentage of recyclables and organic material—materials that could be recovered—going to waste processing facilities and landfills.

Environmental policies support jobs and economic return

By implementing the waste management hierarchy and the principles of waste as a resource, the state can improve the environment as well as realize jobs and economic benefits. Minnesota's recycling industry adds significant value to our state's economy. More than two-thirds of the economic activity related to recycling is generated by remanufacturing secondary materials into new products—value-added recycling manufacturing.

Based on a report done in 2000, Minnesota's value-added manufacturers generated an estimated $93 million in state tax revenue and employed an estimated 8,700 people in direct jobs. These jobs in turn supported another estimated 20,000 people downstream in indirect and induced jobs. All together, these jobs paid an estimated $1.19 billion in wages.

If present recycling trends continue, by 2012, approximately 11,200 people will be employed in Minnesota's value-added recycling manufacturing industry and $133 million will be generated annually in tax revenue. The tax revenue over the next 10 years would be $1.45 billion. If the additional 1.07 million tons of recyclable materials that is thrown in the trash each year were recycled, by 2012, approximately 13,918 people would be employed in the value-added recycling manufacturing industry and $156 million in tax revenues would be generated annually. The tax revenue over the next 10 years would be $1.58 billion.

In 2002, approximately 3 million tons of wastes were either processed or landfilled at a cost of $146 million. Of this amount, approximately 1.07 million tons could still be recovered from the waste stream. These materials when recycled are worth $85 million at current market value. Instead, however, it cost roughly $45 million to manage these materials as waste rather than as resources. Once these materials are discarded, they can no longer generate future revenue streams.

Recycling and organics present challenges and opportunities

From the early 1990s to the mid-1990s, Minnesota's recycling grew at a fast pace. The recycling rate peaked at 47 percent in 2000. In 2001 and 2002, the recycling rate declined slightly for the first time. Over the past decade, the volume of recyclables collected increased at an average of four percent per year, with slight declines in the last two years. Minnesota has the second highest

recycling rate in the United States, if yard waste and waste reduction credits are included, and the sixth highest rate if the credits are excluded (based on data published in December 2001).

Rural recycling programs in Greater Minnesota, in particular, are facing challenges to get materials to distant markets. Some counties are eliminating many or all of their rural recycling drop-off sheds and as a result (in some cases) are drastically reducing the opportunity for residents to recycle. Due to budget cuts, some counties are closing down recycling centers (or strongly considering such action) and limiting the types of materials they collect. Plastic and glass have been hit the hardest, and are being dropped in some communities. For some counties, glass recycling is continuing only because glass can be used in cover material at landfills and for berm construction.

The recovery of organic materials has received significant attention in Minnesota in recent years. Since 1980, the organics industry has evolved from a yard waste or MSW composting industry to one that composts a number of diverse feedstocks. In addition, markets have expanded, and much of the focus now is on developing a broader array of markets for finished compost. Compost facilities accept a variety of feedstocks, including yard waste, mixed municipal waste, source-separated food waste, industrial waste, and, in the case of the Dodge County facility, road kill from the county highway department. In addition, there are yard waste sites in nearly every municipality in Minnesota, as well as a number of privately owned and operated facilities.

A 1999 on-site sort of waste materials going to waste processing facilities and landfills showed that there is considerable potential for improvement in county and city programs, by collecting commonly recyclable and compostable products, such as paper, cardboard, and food waste. The waste composition study showed that approximately 34 percent of the waste is paper, 26 percent is organic material, 11 percent is plastic, 5 percent is metals, and 3 percent is glass and 20 percent is other miscellaneous wastes. Of the organic materials (yard, food, and wood waste) nearly 50 percent is food waste.

This waste composition study is available on the OEA web site at: http://www.moea.state.mn.us/policy/wastesort.cfm

Toxic materials and on-site disposal pose public health and environmental threats

Toxic materials pose a threat to our environment and to public health and safety. By reducing or eliminating toxic materials from the waste stream, we protect solid waste facilities, their workers, and the public's health from potentially harmful effects of these materials. Reuse, reduction, and source separation have been thoroughly documented as the least-cost methods of managing toxic materials.

The on-site disposal of household garbage is banned in Minnesota, with the exception of farms and residences where regularly scheduled pickup of waste is not "reasonably available to the resident" (Minn. Stat. §§ 17.135 and 88.171). Current research indicates that backyard burning is far more harmful to our health and the environment than previously thought. The U.S. Environmental Protection Agency (U.S. EPA) estimates that one burn barrel (from an average family of four) can produce at least as much dioxin as a full-scale municipal waste incinerator burning 200 tons per day. Because residential garbage burning is more common in the rural, agricultural areas of the state, there is particular concern about the high levels of dioxin falling on croplands and concentrating in feed-crops and ultimately the livestock we consume (meat and dairy).

Resource recovery and landfill gas recovery offers energy alternatives

Waste processing includes waste-to-energy, refuse-derived fuel (RDF), and mixed MSW or source-separated compost facilities. Currently, 15 waste processing facilities manage MSW with a capacity of 1.4 million tons per year. In 2002, over 1.28 million tons were processed, representing a 2 percent increase from 2001, although the amount processed has declined 17 percent since 1993.

Minnesota's resource recovery system produces 85 to 100 megawatts of power and generates 2.6 million pounds of steam per hour. Energy produced from MSW is renewable and can be generated 24 hours a day. It contributes to energy diversity. Minnesota's resource recovery system provides energy and economic development benefits to local communities. Twenty-eight counties are served by resource recovery systems. Continued support for current and new resource recovery facilities is needed. New waste-to-energy projects are being proposed: an expansion by Olmsted County and new facilities in Redwood and Pine Counties.

There are four landfills in Minnesota that utilize gas-to-energy systems. Approximately 24 megawatts of energy is generated at these landfills. Three of the landfills provide power to Xcel Energy; the fourth provides power to Elk River Municipal Utility.

Recommended policies, needed research, and proposed strategies

In order to achieve the goals and objectives set forth in this document, the OEA has identified 15 solid waste policies that include public and private actions intended to steer the solid waste system toward an overarching vision of *waste as a resource*. These policies are based on the premise that all waste generators, including governments, businesses, and citizens, take responsibility for the impacts of their production, purchasing, and waste management decisions. Research needs and strategies accompany each policy.

1. Evaluate the development of new goals and funding incentives to support waste reduction and waste as a resource.

Evaluate an incentive based SCORE program

Policy: Evaluate and develop recommendations for an incentive-based distribution approach for SCORE funding.

Policy: Evaluate the development of new statewide/regional/county resource conservation goal, such as a waste abatement goal or a goal that incorporates the various components of a solid waste system. Evaluate waste diversion in order to more comprehensively evaluate county or regional integrated solid waste systems and the environmental benefits and impacts.

Preserve current state funding levels

Policy: Preserve current level of state funding to local units of government, such as SCORE, household hazardous waste programs, processing credit, etc., to fund integrated solid waste programs.

Policy: Build upon the successful models of providing resources to local units of government that can be used and promoted at a local level.

2. Recover recyclables and organic material going to waste facilities.

The waste composition study done in 1999 shows that approximately 26 percent of the waste that is going to waste processing facilities and landfills has the potential to be composted. Composting yard waste and food waste ranks third in the waste management hierarchy. Organics have value, and by recovering organics from the waste stream, we are treating these materials as a resource. If these materials are separated prior to disposal, they can then be processed into compost or other organics, which can be used as a high-quality soil amendment and bring money back to the local community.

Remove collection and market barriers for organics recovery

Policy: Increase the amount of organic materials (primarily food and non-recyclable paper) recovered by removing collection barriers and increasing the quality of reusable food and high-quality compost.

Enhance public and private partnerships to increase collection of recyclables

The waste composition study shows that organics and recyclables are being discarded at landfills and waste-to-energy facilities. These materials have value and can be reused, recycled, or recovered for their highest and best use. According to the waste composition study, approximately 37 percent of the waste that goes to waste facilities has the potential to be recycled. Materials include glass, metal, plastic, and paper, with paper representing the largest amount at 34 percent.

Policy: The state will partner with value-added manufacturers and local government and waste service providers to collect additional post-consumer materials that are not currently being recycled. The state will support strong markets for local and national manufactures of recycled products.

Policy: State agencies should serve as models to local units of government and the public by purchasing environmentally preferable products.

3. Create opportunities with the manufacturing and business sectors for waste reduction and waste as a resource.

Reusing, reducing, and eliminating the generation of waste often create significant cost savings by conserving raw materials and using resources more efficiently. Waste that is prevented at its source does not need to be managed or recycled, which means fewer costs and less pollution from transporting, recycling, processing, or landfilling wastes. Waste reduction helps sustain the longevity and economic viability of the state's waste management system.

Increase reduction, reuse, and recycling by commercial sectors

Policy: Increase reduction, reuse, and recycling efforts by non-residential sectors through technical assistance and financial incentives.

Encourage generators to include incentives in waste hauling contracts

Currently, compensation for waste services is based largely upon volume of waste collected and frequency of pick-up. Language in contracts should realign incentives such that waste service providers have vested interests in assisting generators achieve waste reduction, reuse, and recycling, and are compensated accordingly.

Policy: Encourage communities as well as commercial, service, and institutional generators to enter contracts for waste services that include incentives to reduce, reuse, and recycle waste.

Share in the responsibility for end-of-life product management

Product stewardship promotes the implementation of broad sustainability goals, through product redesign and end-of-life responsibility, pollution reduction, and energy and resource conservation. Product stewardship means that everyone involved in designing, manufacturing, selling, and using a product takes responsibility for the environmental impacts of that product throughout every stage of its life.

Policy: The OEA will continue to work with manufacturers on targeted products to share in the responsibility of managing these products.

Support Design for the Environment

Policy: Encourage businesses to implement Design for the Environment (DfE) practices.

Promote new eco-industrial job zones that use waste as a resource

New challenges are facing Minnesota's solid waste systems, such as the emergence of new and different products and processes, economic factors, and new technologies. These new challenges need to incorporate waste as a resource and should consider the economic and energy benefits of new systems in an attempt to revitalize local economies.

Policy: As part of the integrated solid waste system, support programs and facilities that use waste as a resource, such as organic facilities, value-added manufacturing facilities, recycling facilities, and new resource recovery capacity.

4. Reduce toxic materials and on-site disposal.

The OEA will identify products that when disposed of create toxic emissions, releases, or contaminants. When these products become waste, they can create problems at landfills, incinerators, or compost facilities, or in residual streams (ash, compost, leachate) from those facilities. These products will be the focus of toxicity reduction and product stewardship efforts.

Remove toxics from the waste stream

Policy: Products and waste that result in emissions of toxic chemicals that affect air, water, and land should be identified and a plan developed to remove the materials from waste.

Support initiatives that reduce toxics in products

Policy: Support initiatives that reduce toxics in products, such as developing labeling standards and promoting consumer purchasing of alternative products that exhibit nontoxic characteristics.

Eliminate on-site disposal

Policy: Promote the elimination of on-site disposal, including open burning.

Part 1

Framework and Vision

The policy report is based on state solid waste policy according to state statute, the principles of *waste as a resource*, and the recommendations of the State Solid Waste Advisory Committee. It was developed with input from various sources.

The OEA staff conducted six regional meetings to gain input from county representatives on the challenges facing solid waste programs. From these meetings, regional profiles were developed and are included in Appendix A. In addition, OEA staff met with representatives of solid waste facilities and programs, both private and public, and with environmental and nonprofit organizations. Lastly, four public meetings were held in October 2003 with public, private, and nonprofit representatives to discuss proposed recommendations for the policy report.

State solid waste policy

The goal of the Waste Management Act (Minn. Stat. § 115A.02a) is to protect the state's land, air, water, and other natural resources and the public health by improving waste management in the state in order to reduce the amount and toxicity of waste generated, increase the separation and recovery of materials and energy from waste, and coordinate the statewide management of solid waste and the development and financial security of waste management facilities, including disposal facilities.

The waste management goal of the state is to foster an integrated waste management system in a manner appropriate to the characteristics of the waste stream, and thereby protect the environment and public health. The Waste Management Act (WMA) ranks waste management practices in the following order of preference:

1. Waste reduction and reuse.
2. Waste recycling.
3. Composting of yard waste and food waste.
4. Resource recovery through mixed municipal solid waste composting or incineration.
5. Land disposal which produces no measurable methane gas or which involves the retrieval of methane gas as a fuel for the production of energy to be used on-site or for sale.
6. Land disposal that produces measurable methane, but does not involve the retrieval of methane gas as a fuel for the production of energy to be used on-site or for sale.

Waste as a resource

This policy report has as an overarching theme: treating waste as a resource. The OEA believes that this is the best way to implement state policy and the WMA hierarchy. This concept is based on the following principles of sustainability and resource conservation:

- **Treating waste as a resource reduces pollution.** Shifting waste management practices toward those that better manage waste as a resource, such as waste reduction, reuse, recycling, composting, or resource recovery leads to reductions in the amount of pollution released to the environment, including greenhouse gases.

- **Reducing waste saves money and creates jobs.** Reducing and eliminating the generation of waste often creates significant cost savings by conserving raw materials and using resources more efficiently in the production of products.

- **Materials in waste often have value.** If certain materials are separated prior to disposal, these materials can be reused, recycled, or recovered for their highest and best use. For example, the organic portion of garbage can be kept separate in one's kitchen before it gets to the curb, and then processed into compost, which can be used as a high-quality soil amendment. As seen in the city of Hutchinson, this can bring money and jobs back to the local community.

The key is to think differently about the products we make, design, buy, and use, so that manufacturers, retailers, and consumers think about and treat by-products of their activities and products at the end of their useful lives as *resources* rather than waste. Businesses can gain a competitive edge by recognizing that creating waste is both economically and environmentally inefficient. In Minnesota, a growing number of businesses (both large and small) are implementing comprehensive environmental programs within their companies to improve their bottom line, protect the environment, and gain an edge over their competitors.

Our decisions have impacts beyond the waste management system, and can only be understood when we look at how the materials are made, distributed, and enter the waste system. Our measures of success should not be based solely on determining the quantities of waste diverted from landfills. By using life-cycle assessment methods, we can measure on a material-by-material basis the amount of air and water pollution avoided, and the tons of natural resources saved by treating waste as a resource. In addition, the tools are now available to analyze and compare the environmental risks and costs of waste management systems with reuse, resource recovery, and recycling systems. Analytical methods, such as various risk analyses, benefit-cost, and economic methods, enable us to measure and demonstrate progress toward much more precise and meaningful objectives.

By implementing waste as a resource and by using the new analytical tools available, decision makers will have more information on which to base their decisions. Equally important is that the concept of waste as a resource allows greater flexibility to deal with new challenges facing Minnesota's solid waste system, such as the emergence of new and different products and processes, changing social values, economic factors, and new technologies.

Vision for managing Minnesota's solid waste

From 2001 to 2003, the State Solid Waste Advisory Committee met to develop a series of options to help fully implement the state's integrated solid waste management system in a manner that protects the environment, conserves the state's resources, maximizes landfill abatement, and considers the cost and benefits of each option and disposal method. This 27-member group was composed of policymakers from the state and local levels, including legislators and local elected officials, generators of commercial and residential solid waste, the waste management industry, environmental groups, and citizens of the state. In January 2003, the committee developed a vision for solid waste management in Minnesota.

Vision

A sustainable community seeks a better quality of life for current and future residents by maintaining nature's ability to function over time. It minimizes waste, prevents pollution, promotes efficiency, and develops resources to revitalize local economies. The waste management system is a component of the infrastructure of a sustainable community. Therefore, solid waste will be managed by technologies and methods that support sustainable communities and environments. The solid waste hierarchy, with its associated goal of protecting the state's land, air, water, and other natural

resources and the public health, is central to attaining the objectives of sustainability and solid waste management.

Goals

The committee developed goals and possible action steps, including those outlined below. Some of the possible action items received unanimous support from the committee, while other received support from a majority of the committee. In addition, the committee voted unanimously on "supporting stable and sufficient funding for today's solid waste system. All revenues from the Solid Waste Management Tax (SWMT) should pay for solid waste needs" and felt that this should be the primary recommendation of the committee.

The Goals ("Desired Outcomes")

1. To manage waste in a manner that will protect the environment and public health and that will conserve resources.

   Develop a plan for product stewardship of high-risk products.

   - All parties, including manufacturers, must understand the high cost of managing "high-risk" products, and that shared responsibility for those costs would be preferable.
   - Set up a statewide panel or a structure similar to the Listed Metals Advisory Council to identify problem materials and to develop management options.
   - Keep electronics, e.g., personal computers, out of the waste stream as a state policy—and set a timeline to achieve this goal. Encourage manufacturers to come forward with a plan in one year and report back on their plan.
   - Establish a panel of stakeholders to develop a plan for state educational eco-labeling for products and packaging.

2. To manage waste in an integrated waste management system in accordance with the hierarchy in order to minimize landfilling, with an increased focus on maximizing reduction, reuse, recycling, and source-separated composting.

   - Utilize the existing funding structure (Solid Waste Management Tax, landfill fees, Solid Waste Management Fees, and generator bills).
   - Maximize use of existing facilities (i.e., these may be good facilities to use for organics composting).
   - Implement the goals of the state hierarchy.
   - The state's integrated solid waste management system should be diverting the large amount of potentially compostable and recyclable materials now being discarded as part of the total three million tons of Minnesota MSW burned or buried each year.
   - Create a state plan that would set goals for waste reduction, recycling, composting, and processing.
   - Seek legislation to clarify that source-separated compost can be exempt [from the Solid Waste Management Tax] under a variety of conditions (possibly limited to certain sectors of generators, like food markets and schools) as long as the material is actually composted and is used as compost.
   - Establish a statewide aggregate goal to achieve an 85 percent reduction by weight of municipal solid waste landfilled by the year 2020 by managing it through the highest and best use economically feasible. A panel of stakeholders should be convened to develop an implementation plan to achieve this goal.

- Set phased-in goals for the prevention of compostables being disposed of with mixed waste.
- The statutory definition of "processing" should be examined to ensure that actual processing methods are referenced and to avoid unintended inclusion of transfer processes.

3. To manage waste in a cost-effective manner that accounts for environmental benefits and that minimizes the long-term financial liability for citizens, businesses, and taxpayers.

   - Match materials with waste processing methods. Such a strategy could be derived from the state plan noted above that would set goals for waste reduction, recycling, composting, and processing.

4. To cause generators to take responsibility for the environmentally sound management of their waste and to allocate solid waste management system costs equitably among those who use or benefit from the system.

   - Develop uniform waste regulations: Ban on-site disposal statewide.
   - The state should ban the open burning of household waste statewide.
   - Assure that all residents of the state have access to curbside or convenient drop-off services for MSW, construction and demolition (C&D) waste, and recyclables by 2005.
   - Make waste management/waste processing rules more flexible to allow innovation.
   - Support stable and sufficient of funding for today's solid waste system. All revenues from the SWMT should pay for solid waste needs.
   - Solid waste funding needs are greater than the revenues allocated. Therefore, the Solid Waste Management Tax (SWMT) should be kept at the current rate and SWMT revenues should all go to solid waste management expenses.
   - Enhance and develop sustained education of public regarding personal responsibility.

5. To ensure accurate and complete accounting of all data, i.e., waste generation, disposal, recycling, reuse, revenues, and expenditures.

   - Develop better data and statewide confidence in the data and data measurement. Determine methods of obtaining accurate numbers for commercial waste generation and recycling.
   - Ensure full cost and benefit accounting of all waste management systems and methods.

6. To maximize the use and value of recovered materials.

   - Give incentives for local governments and the private sector by providing a two-year pilot sales tax holiday on the following recycled products:

     a. Copier paper with 30 percent post-consumer content or higher
     b. Coated printing paper with a minimum of 10 percent post-consumer recycled content
     c. Uncoated printing paper with a minimum of 30 percent post-consumer recycled content
     d. Re-refined motor oil that is certified for gasoline engines by the American Petroleum Institute.

   - The committee believes that the above recommendation can be implemented as a revenue-neutral initiative.
   - It should be Minnesota's policy that public entities shall buy environmentally preferable products including recycled content.

Part 2

Current Status of Solid Waste Management in Minnesota

Public and private sector roles

Minnesota's solid waste system consists of partnerships between state and local government, commercial and residential waste generators, waste haulers, recyclers, and operators of landfills and recycling and resource recovery facilities. Both the private and public sectors own and operate composting facilities, resource recovery facilities, landfills, and materials recovery facilities.

Minnesota counties are responsible for ensuring proper management of solid waste within their jurisdictions. County activities include all parts of an integrated waste management program, including waste reduction, recycling, household hazardous waste management (HHW), processing, and the landfilling of MSW. Seventeen intercounty solid waste jurisdictions exist in the state (see Figure A-1 in Appendix A). These jurisdictions vary in their authority and responsibilities, mostly under joint powers agreements. Some operate waste facilities and management programs, and some exist in an advisory capacity and work on education and planning issues.

Cities and towns play a major role in implementing county solid waste plans, frequently undertaking the curbside collection of recyclables. They also play a role in the collection of MSW and yard wastes, and have authority to collect fees to pay for solid waste services and may impose fees on operators of solid waste facilities.

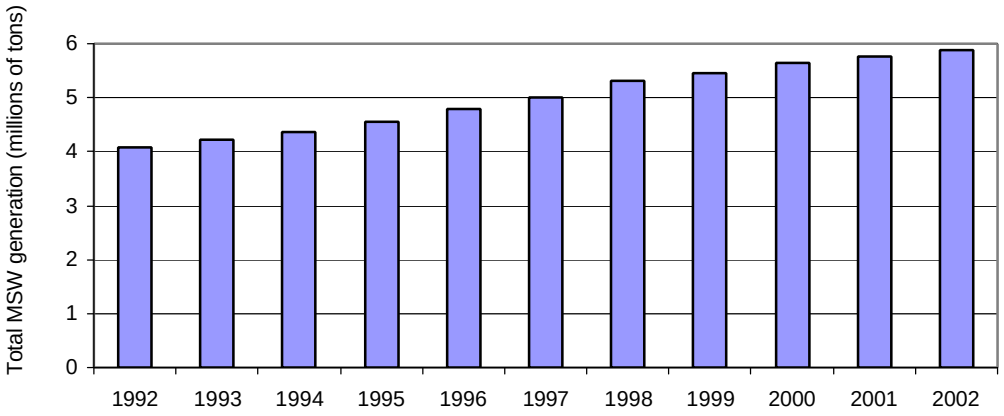
The OEA provides technical and financial assistance to local governments, businesses, and the public to improve solid waste management. In July 2003, the Household Hazardous Waste Program was transferred from the Minnesota Pollution Control Agency (MPCA) to the OEA. The OEA provides planning assistance, approves county solid waste plans, and makes policy recommendations to the Legislature. The MPCA establishes and enforces solid waste regulations, issues facility permits, and administers the Landfill Cleanup Program. The MPCA provides technical assistance, training, and groundwater monitoring.

The collection of MSW and recyclables is done mainly by private companies. Many local governments contract with private companies to collect MSW and recyclables. A few municipalities collect MSW with their own trucks. Resource recovery facilities and landfills are owned and operated by counties as well as private waste businesses and public utilities.

Waste generation trends

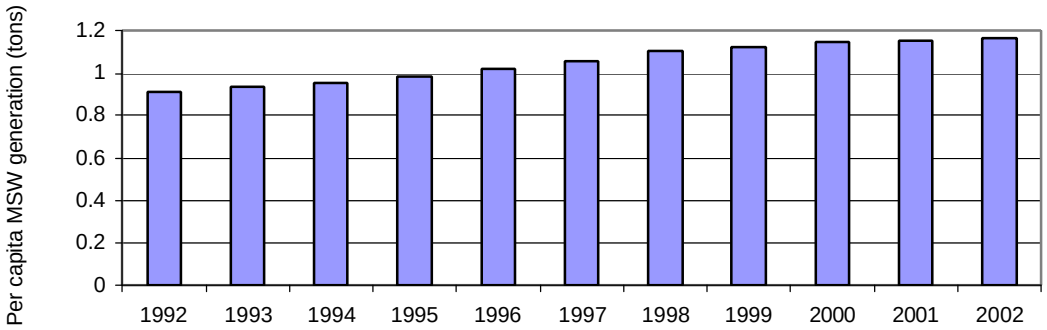
In 2002, Minnesota generated almost 5.9 million tons of mixed MSW. This included all waste sent to processing facilities and landfills, materials recycled, materials disposed of on site, and problem materials not recycled. This represented a 2.3 percent increase from 2001, and a 50 percent increase since 1992. Over the last ten years, MSW generation increased at an average rate of 3.7 percent each year (see Figure 2-1).

Figure 2-1. Minnesota MSW generation



In 2002, the per capita MSW generation was 1.17 tons per person, an increase of 1.2 percent from 2001. Over the last 10 years, per capita MSW generation increased at an average rate of 2.5 percent each year (see Figure 2-2). Despite a statutory goal (Minn. Stat. §115A.55, subd. 4) to reduce the per capita MSW generation 10 percent by the year 2000 from 1993 levels, the per capita generation increased by 32 percent over that time period.

Figure 2-2. Per capita MSW generation

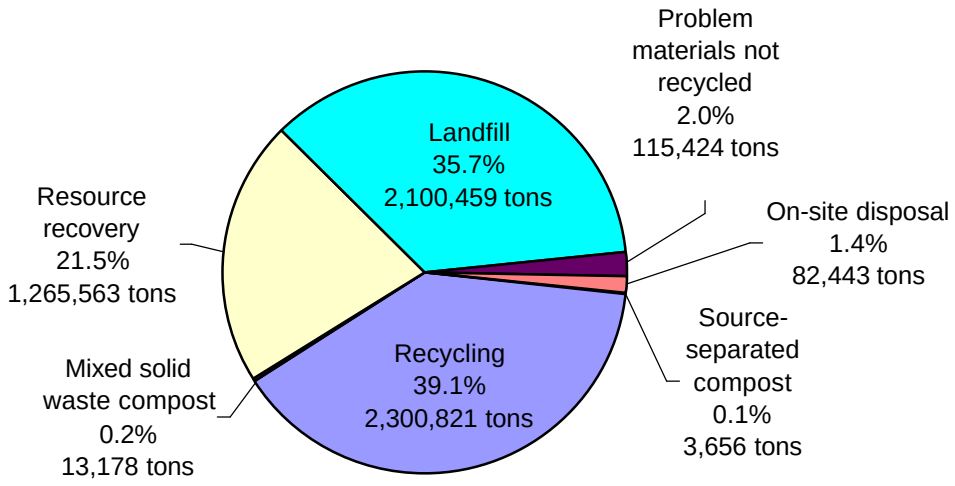


**Per capita MSW generation figures do not include yard waste.*

Waste management methods

Figure 2-3 illustrates how MSW was managed in 2002.

Figure 2-3. MSW management in Minnesota



Waste reduction shows promise

For at least the past decade, Minnesota has been generating more solid waste each year. However in recent years, this rate of growth has been slowing, suggesting that some level of waste reduction is occurring. The OEA has documented some reduction of solid waste generation by businesses and households through the Minnesota Technical Assistance Program, grants administered by the OEA, and the OEA's waste reduction media campaigns. In addition, recent reports by the U.S. Environmental Protection Agency (EPA) document waste reduction by U.S. manufacturers and businesses. The OEA will evaluate the EPA research and its relationship to Minnesota, in an attempt to quantify the waste reduction occurring in Minnesota and the effectiveness of state programs.

Recycling rates have plateaued in recent years

From the early 1990s to the mid-1990s, Minnesota's recycling rate (calculated as a percent of the waste stream) grew at a fast pace (see Figure 2-4). The recycling rate peaked at 47 percent in 2000. In 2001 and 2002, the recycling rate declined slightly for the first time. Over the past decade, the volume of recyclables collected increased at an average of four percent per year, with slight declines in the last two years (see Figure 2-5). This growth in recyclables collected enabled the recycling rate to keep pace with the growth in waste generation. Since the SCORE program began in 1989, Minnesota recycling volumes have increased by over 200 percent.

In 2002, 25 percent of the materials collected for recycling came from residential sources and 75 percent from commercial, industrial, and institutional (CII) sources. This ratio of residential to CII has remained approximately the same for the last four years.

Figure 2-4. Minnesota's recycling rate

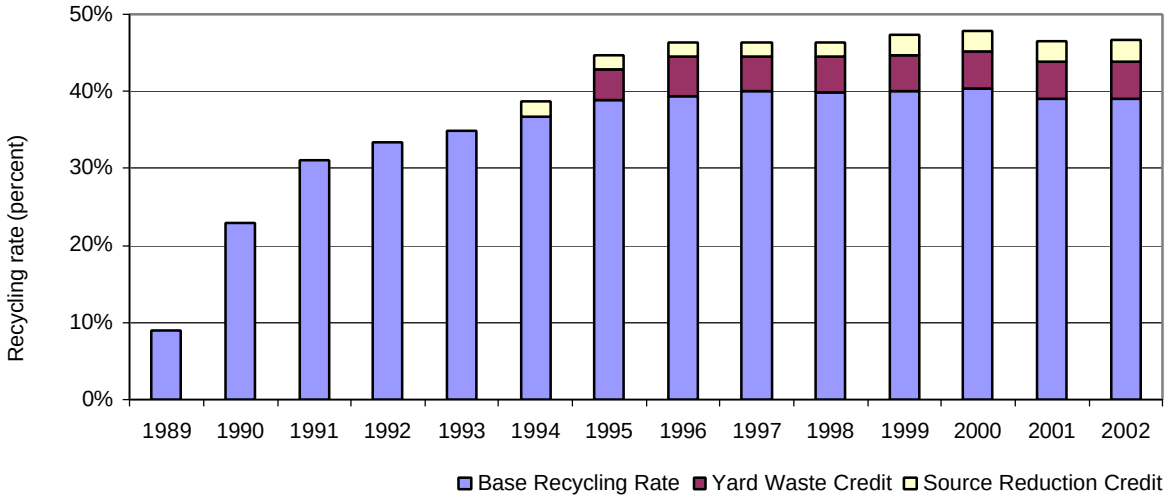
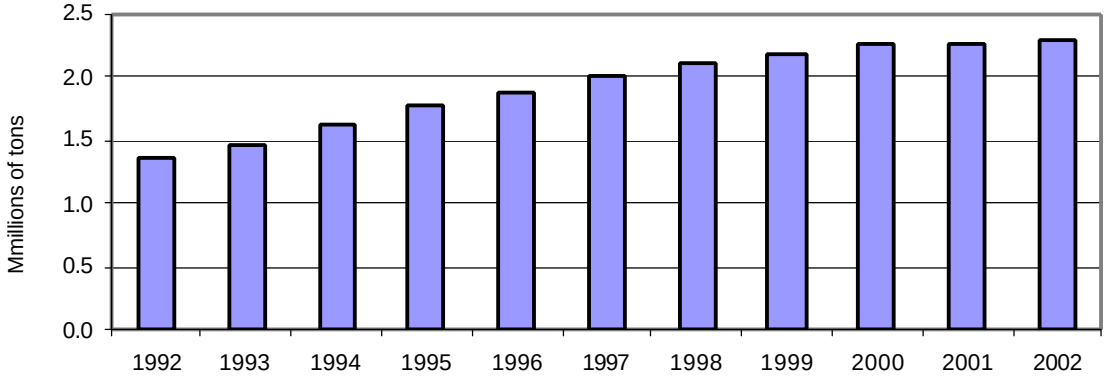


Figure 2-5. Tons recycled in Minnesota



According to *BioCycle* magazine's survey of state programs, Minnesota has the second highest recycling rate, if yard waste and waste reduction credits are included, and the sixth highest rate if the credits are excluded (based on data published in December 2001). This high recycling rate has been one of the great successes in implementing state solid waste policy.

New programs focus on organics

The recovery of organic materials has received significant attention in Minnesota in recent years. Since 1980, the compost industry has evolved from a yard waste or MSW composting industry to one that composts a number of diverse feedstocks. In addition, markets have expanded, and much of the focus now is on developing a broader array of markets for finished compost. Table 2-1 provides examples of compost facilities accepting diverse feedstocks, including yard waste, mixed municipal waste, source-separated food waste, industrial waste, and, in the case of the Dodge County facility, road kill from the county highway department. In addition, there are yard waste sites in nearly every municipality in Minnesota. There are also a number of privately owned/operated facilities as shown in Table 2-2.

Table 2-1. Examples of publicly operated organics programs in Minnesota

Type of facility	Facility owner	Feedstock	Tons per year
Yard waste and source-separated food waste	City of Hutchinson	Yard trimmings/leaves/source-separated food waste	2,124
Yard waste	Olmsted County	Yard trimmings/leaves	NA
Mixed municipal waste	Prairieland	Mixed municipal waste	8,636
Source-separated organics	Swift County	Source-separated organics	1,916
Yard waste and source-separated organics	Western Lake Superior Sanitary District (WLSSD)	Yard trimmings/source-separated organics	359

Table 2-2. Examples of privately operated organics programs in Minnesota

Type of facility	Facility owner/location	Feedstocks
Yard waste	Buberl Recycling, Washington County	Yard waste, manure
Yard waste	Hillier's Compost/Mower County	Yard waste
Industrial organics	Mississippi Topsoil, Stearns County	Chicken waste from Golden Plump
Yard waste, source-separated organic compost	NRG Processing Solutions, Metropolitan Area	Yard waste, source-separated organics
Yard waste	Southern Minnesota Construction, Mankato	Yard waste

Many of these facilities began by accepting a single feedstock and over time diversified to multiple feedstocks, such as the city of Hutchinson's CreekSide compost facility, the WLSSD compost facility, the NRG compost facility, and the Buberl Resource Recovery facility. This national trend is driven by the need to produce more finished product to meet market demand and balance the carbon-nitrogen needs of compost feedstocks.

In addition, a number of new efforts have begun or are in the planning phase. Examples of new programs include:

- **All Seasons Food Rescue.** This program proposes to collect perishable food and redistribute it to organizations that feed Minnesota's hungry.
- **Boise Forte Reservation, St. Louis County.** The Boise Forte Reservation is in the preliminary stages of planning an organics collection/composting program at their Fortune Bay Casino located near Tower, Minnesota.
- **Minnesota State Fair.** The State Fair introduced an organics collection program in its Food and Horticulture buildings in 2002 and 2003.

The Metropolitan Solid Waste Management Coordinating Board provided funding for five organic materials management projects.

1. **City of Burnsville.** Burnsville received a grant to conduct a pilot project in the neighborhood of North River Hills. The overall goal of the pilot project is to identify opportunities, challenges, and barriers to implementing a permanent curbside organics program in the metropolitan region.

2. **City of Wayzata.** The collection of residential organics began in April 2003. The city contracts with a private hauler to collect MSW, recyclables, and organics. Over 25 percent of Wayzata's households are participating in the program.

3. **Independent School District 196, Dakota County.** In the 2002-03 school year, students at all 30 schools (28,500 students/4,000 staff) in ISD 196, the fourth largest school district in Minnesota, collected organic waste, such as food scraps, milk cartons, napkins, and lunch bags, to be composted and remanufactured back to the soil. The district diverted 1,050 tons of waste to the compost facility, resulting in a 10 percent savings in waste hauling fees.

4. **PGA Golf Tournament.** Carver County managed the collection of food waste and non-recyclable paper from the PGA Championship at Hazeltine National Golf Course in Chaska in August 2002.

5. **Washington County.** The county conducted a pilot project that identified options for recovering organic materials and explained the economic incentives that drive business behavior, such as the Ramsey and Washington County Environmental Charge.

Household hazardous waste programs face challenges

The household hazardous waste (HHW) program is a partnership between counties and the OEA. The program provides education about products, including their purchase, use, and storage, and maintains a network of regional, local, and mobile facilities to collect and properly manage HHW statewide. In addition to permanent facilities, many counties offer mobile collections, either one-day collection events or temporary collection sites. Currently, there are 57 HHW collection facilities, and households in all 87 counties have access to a collection program. (See Figure A-6 in Appendix A.) In addition, there are 13 very small quantity generator (VSQG) collection programs to assist small businesses that generate hazardous waste. These programs collected approximately 416,000 pounds of hazardous waste in 2002.

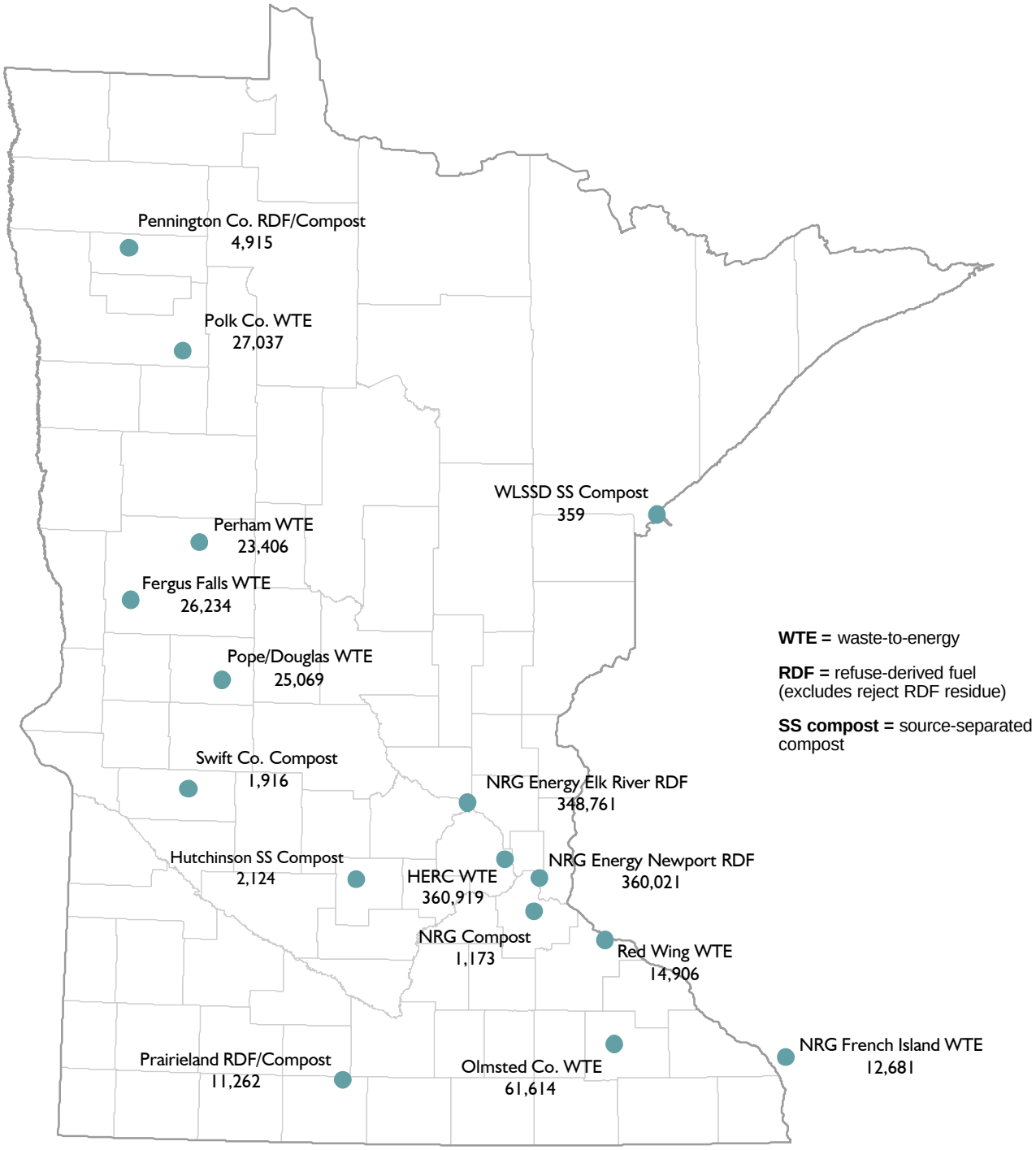
Collected HHW is sorted and consolidated at facilities. Usable products are offered to the general public free of charge. The majority of the waste products are recycled or blended into fuels for use by industry. Toxic flammable wastes are destroyed at federally and state regulated incineration facilities. The amount of HHW generated by households continues to increase each year, but the rate of increase in Greater Minnesota is much lower than it was in the first 10 years of the program. However, the metropolitan region continues to see an increase in participation and volume. In 2002, approximately 211,130 households in Minnesota brought waste to a HHW collection site/facility.

Household hazardous waste programs face a number of challenges, including increasing pressure on county budgets, which is causing some counties to reduce HHW staff, open hours, and numbers of events; changing consumer purchasing habits; progress in working with manufacturers to reduce the toxicity of household products; and the increasing volume of hazardous waste coming to facilities, possibly including agricultural pesticides. In 2002, the Minnesota Department of Agriculture reduced funding for pesticide collections, and counties may be faced with difficult decisions regarding managing waste pesticides. The 2005 ban on cathode ray tubes may also present a challenge for HHW programs.

Waste processing facilities operate at near capacity

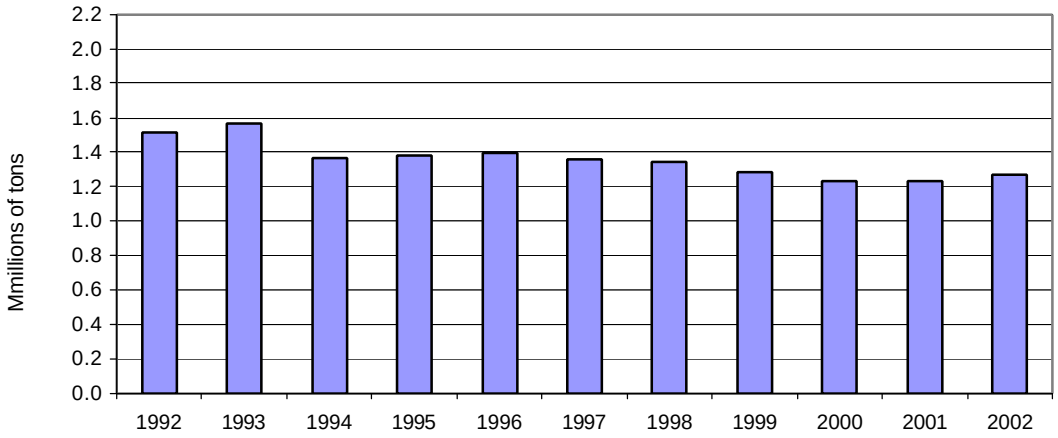
Waste processing includes waste-to-energy, refuse-derived fuel (RDF), and mixed MSW or source-separated compost facilities. Currently, 15 Minnesota waste processing facilities manage MSW with a capacity of 1.4 million tons per year. One processing facility in Wisconsin accepts waste from southeast Minnesota. Figure 2-6 shows the type and location of the facilities and the amount of MSW, in tons, received in 2002.

Figure 2-6. Processing facilities receiving MSW



In 2002, over 1.28 million tons of waste was processed, representing a 2 percent increase from 2001, although the amount processed has declined 17 percent since 1993 (see Figure 2-7). Processing facilities in Minnesota have preserved an equivalent of approximately 35 million cubic yards of landfill capacity since they began operating in 1982. This represents 11 years worth of landfill capacity at current fill rates.

Figure 2-7. Quantity of waste processed in Minnesota

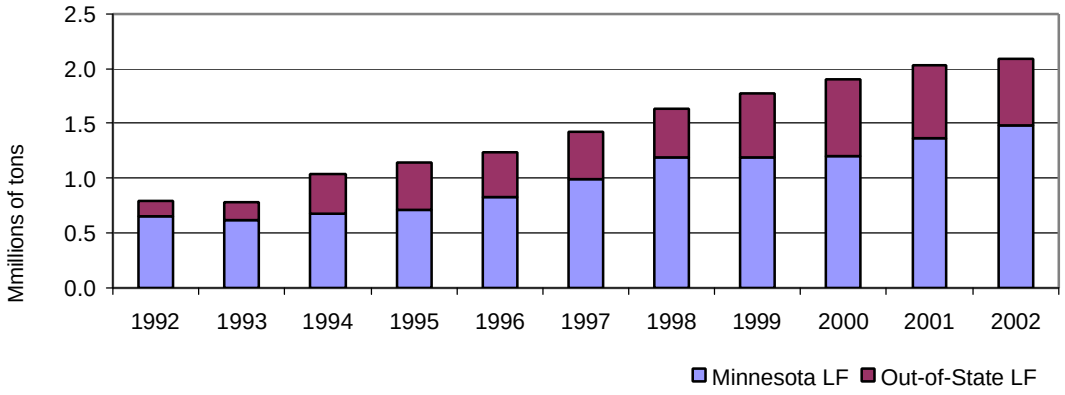


Landfilling continues to increase

In 2002, 2.1 million tons of MSW went to landfills located in Minnesota and surrounding states. Since 1992, the amount of MSW landfilled has steadily increased (see Figure 2-8).

The amount of waste going to out-of-state landfills has decreased over the last few years. A number of factors influence whether Minnesota MSW goes to out-of-state landfills, including haul distance, fuel costs, landfill tip fees and taxes, and landfill ownership.

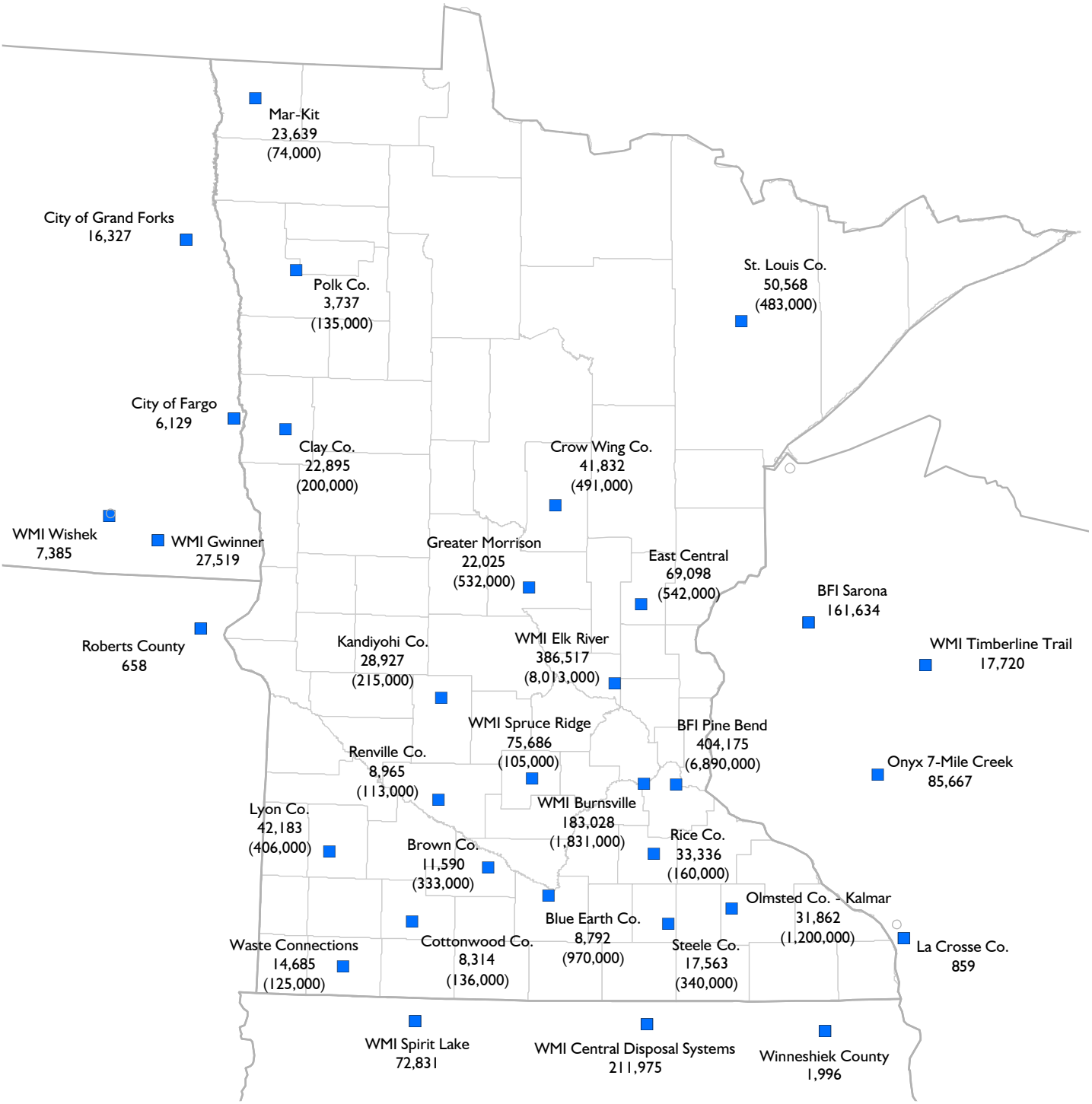
Figure 2-8. Quantity of Minnesota waste landfilled



In 2002, Minnesota counties operated 16 landfills that accepted 423,000 tons of MSW, and private companies operated five landfills in Minnesota that accepted 1,064,000 tons and 12 out-of-state landfills that accepted 611,000 tons from Minnesota (see Figure 2-9). Currently, there are six

permitted leachate recirculation pilot projects in Minnesota, with a seventh project being reviewed. The projects will continue for approximately 6 to 8 years, and the results will be studied and evaluated by the MPCA.

Figure 2-9. Landfills accepting waste from Minnesota



**Numbers shown represent MSW tons received in 2002.*
Numbers in parenthesis represent the number of cubic yards of remaining permitted capacity.

The landfills located in Minnesota have approximately 26 million cubic yards of remaining capacity, which is estimated to last approximately nine years at present waste growth and fill rates. Of the 52 million cubic yards of remaining capacity at landfills located in Iowa, Wisconsin, and North Dakota, it is assumed that about 31 million cubic yards may be available for Minnesota waste (see Table 2-3). Eighty percent of waste delivered to three landfills in Iowa originated from Minnesota. In addition, there are numerous landfills in the bordering states that do not currently accept waste from Minnesota, but may have the potential to do so in the future. Two privately owned landfills have proposed to expand the MSW capacity in Minnesota by an approximate 4 million and 13 million cubic yards, respectively.

Table 2-3. Remaining capacity at landfills serving Minnesota

Landfill	Remaining permitted capacity (cubic yards)	Remaining permitted capacity (tons)
Minnesota	26,214,000	18,622,000
Wisconsin*	11,837,000	10,467,000
Iowa*	37,400,000	32,912,000
North Dakota*	2,800,000	2,800,000
Total	**78,254,000**	**64,500,000**

**Not all capacity is available for Minnesota waste.*

If present disposal trends continue, landfilling is expected to increase dramatically over the period 2003 to 2015. According to projections, approximately 4 million tons of MSW per year will be disposed of in landfills by 2015, representing an 80 percent increase in landfilling. Over this period of time, approximately 41 million tons of MSW would go to landfills. As previously mentioned, currently approximately 37 percent of the MSW going to waste processing facilities and landfills is recyclable and another 26 percent is organic. This presents both a tremendous challenge and opportunity to recover these materials and resources, save on disposal costs, and save valuable landfill space.

State and local government funding

In 1989, the Minnesota Legislature adopted comprehensive legislation based on the recommendations of the Governor's Select Committee on Recycling and the Environment (SCORE). The law provides state funding for waste reduction, recycling programs, yard waste composting, and waste processing to counties that provide at least a 25 percent match. In 2002, counties exceeded the required match by tenfold, spending nearly $47 million in state and local funds for SCORE-related programs. Cities, townships, and other local units of government also funded programs for waste management, reduction, and recycling.

The Solid Waste Management Tax generated approximately $56 million from January 1, 2002, through December 31, 2002. Of this, 50 percent was deposited into the Solid Waste Fund and 50 percent was deposited into the state's general fund. Funding for the 2004-2005 biennium (July 1, 2003 to June 30, 2005) is allocated as follows:

- $12.5 million each year for SCORE, with $7,060,000 from the general fund and $5,440,000 from the environmental fund.

- $4 million each year from the environmental fund for mixed municipal solid waste processing payments, under Minn. Stat. § 115A.545.
- $1,041,000 from the environmental fund for household hazardous waste programs.

In 2003, the Solid Waste Management Coordinating Board (SWMCB) received $1,029,773 from the Metropolitan Landfill Abatement Account (MLAA) and $1,308,426 from the Local Recycling Development Grant (LRDG) account. Scott County received $125,162 from LRDG. The OEA spent $286,000 in fiscal year 2003 on support for MLAA in administrative expenses.

SWMCB's expenditures for 2003

Communications and outreach	$973,695
Regional policy	$309,365
Collaborative activities	$152,430
Administration	$166,530

Part 3

Extent and Effectiveness of Solid Waste Programs

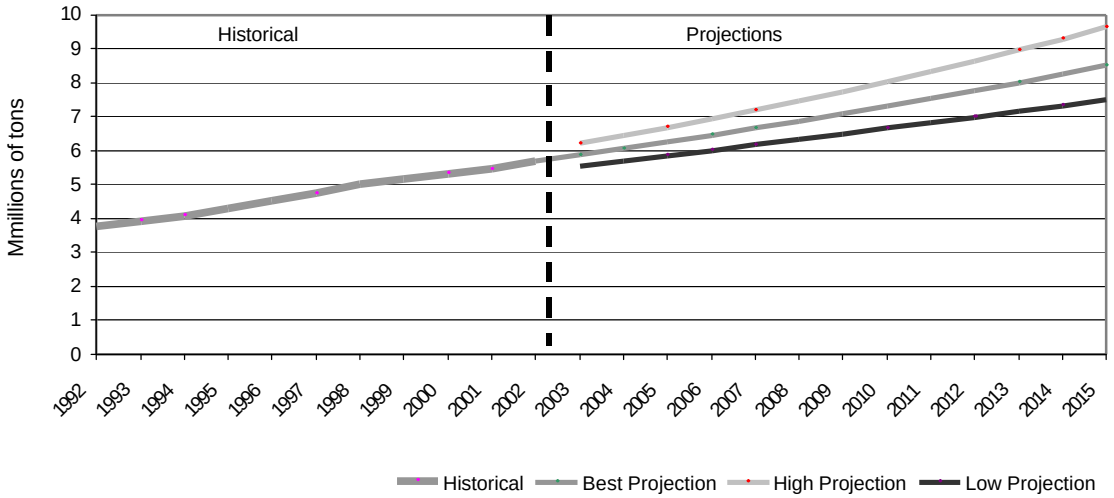
Projected increases in waste generation pose challenges for programs

Minnesota's MSW generation has steadily increased over the last 10 years. Despite a statutory goal (Minn. Stat. §115A.55, subd. 4) to reduce the per capita MSW generation by 10 percent from 1993 levels, the per capita generation level increased by 32 percent over that time period.

Looking at future MSW generation, the OEA derived projections using a statewide per capita generation average (0.66/tons/person/year), a per capita growth rate (2.16 percent/year), and the state demographer's population projections. The MSW projections are based on historical MSW generation and recycling data reported between 1992 and 2002.

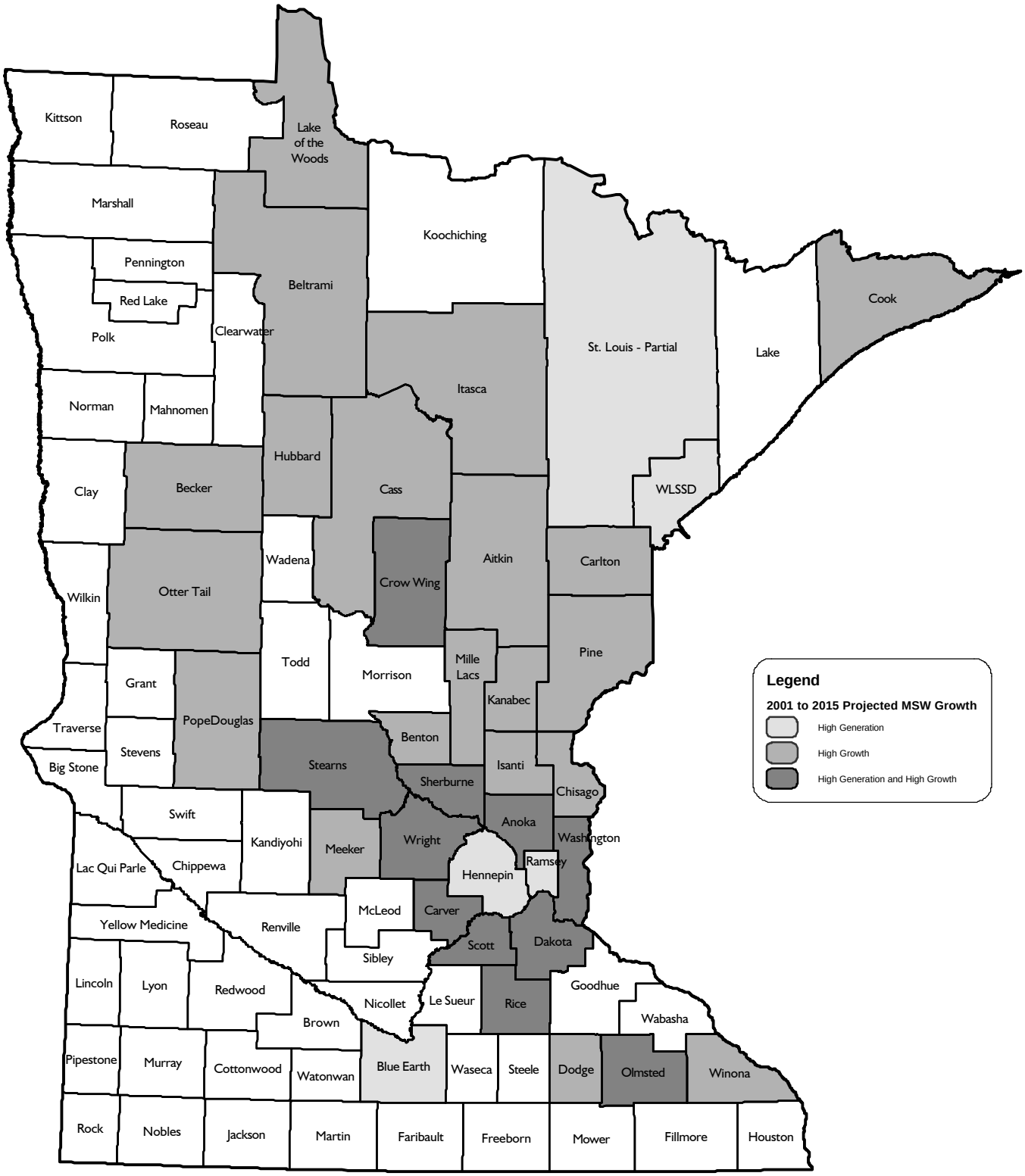
The projections show that MSW generation will steadily increase from 5.9 million tons in 2002 to 9.1 million tons in 2015 (see Figure 3-1). The OEA calculated a 95 percent confidence interval around the "best" estimate, using statistical techniques based on a regression analysis. These confidence intervals were then used to calculate "high" and "low" estimates. If historical data is indicative of the future, there is a 95 percent chance that future waste generation will be inside the specified range.

Figure 3-1. Projected growth in waste to 2015



MSW projections were also developed for counties. Figure 3-2 shows the counties with high MSW generation (currently generating or expected to generate more than 50,000 tons of MSW a year by 2015) and counties with high MSW growth (more than 50 percent between 2003 and 2015). Significant new waste management infrastructure challenges are expected to occur in these counties.

Figure 3-2. Projected growth in waste by county, 2001-2015



Counties with high MSW generation	Hennepin, Ramsey, St. Louis, Blue Earth, and WLSSD.
Counties with high MSW growth	Chisago, Aitkin, Cass, Hubbard, Cook, Dodge, Pine, Pope, Douglas, Otter Tail, Beltrami, Lake of the Woods, Kanabec, and Mille Lacs.
Counties with high MSW generation and high MSW growth	Scott, Carver, Washington, Wright, Sherburne, Crow Wing, Olmsted, Anoka, Dakota, Stearns, Wright, and Rice.

High MSW generation and high MSW growth will continue to be concentrated in the Twin Cities region, IN regional centers such as Rochester and St. Cloud, and in Minnesota's lake regions along U.S. Highways 169 and 371 and Interstate 94. MSW growth is less pronounced in other areas of the state. However, in most areas, the MSW growth is projected to be consistent with past growth rates.

Continued waste growth will put pressure on the capacity of the materials and resource recovery infrastructure, particularly in these high growth areas, and it will also result in more landfilling. The waste projections demonstrate the importance of reducing waste generation. Waste reduction provides environmental benefits and avoids the costs associated with the production of finished goods and packaging, energy used in materials production, and land use (e.g., forest use, extraction, landfilling).

To date, current policies and tools have not been effective in reducing the growth of waste generation. A new approach is needed. Minnesota is one of a handful of states that has demonstrated on a pilot scale that waste reduction can work (e.g., www.reduce.org and the Junk Mail Campaign). Preliminary research shows that the growth in the waste stream is coming primarily from the commercial, industrial, and institutional sectors.

Environmental policies support jobs and economic return

By implementing the waste management hierarchy and the principles of *waste as a resource*, Minnesota can improve the environment, as well as realize jobs and economic benefits.

Reducing and reusing saves money

A report prepared for the OEA by the Tellus Institute in 1997, conservatively estimates that for each ton of MSW reduced, businesses save $500 in avoided material purchases. Specific material savings include textiles and aluminum at $2,000 per ton, food at $1,000 per ton, and office paper at $1,300 per ton.

Materials exchange

In 2002, Minnesota's Technical Assistance Program (MnTAP) saved businesses $2.7 million through its waste reduction, reuse, and pollution prevention assistance. In 2002, the Minnesota Materials Exchange Alliance, funded by the OEA and coordinated by MnTAP, resulted in a total of 414 exchanges of 2.6 million pounds of solid and hazardous waste. These exchanges saved businesses $994,000 in avoided purchase and disposal costs.

Junk mail campaign

In another example, in January 2001, the OEA in partnership with local units of government, local electric utilities, and other interested organizations launched a new waste reduction campaign: "Reduce the hail of unwanted mail." Through public outreach and media advertising, Minnesotans were encouraged to follow seven easy steps designed to significantly reduce the amount of unwanted mail and unsolicited advertising circulars.

At the start of the campaign, the Direct Marketing Association (a national association representing advertisers and other direct marketing firms) reported that 115,000 Minnesota citizens were registered to "opt out" of mailing lists with DMA's mail preference service. As of October 2003, over 217,000 Minnesotans are registered, representing an 88 percent increase in the number of residents who have taken steps to reduce the amount of unwanted mail they receive.

Assuming that 32 pounds of unwanted mail was eliminated for the 102,000 additional Minnesotans registered for the mail preference service, the cost of the campaign is $34 per ton. If residents only took some of the steps and therefore only reduced 16 pounds per year, the cost is $68 per ton. This cost per ton range of $34 to $68 is competitive with and, in many cases, more attractive than other waste management practices such as recycling, processing, and landfilling.

Design for the Environment

Economic benefits can be expected from manufacturers that integrate Design for the Environment (DfE) into product design. For example, an OEA grant to General Mills is showing initial cost savings. One production line is expected to reduce its waste generation by 33 percent or 895 tons annually, which will result in annual cost savings of $400,000. Similar waste reduction is expected to be duplicated on all 16 product production lines at the plant. The potential solid waste disposal cost savings for the entire facility is expected to be at least $1.6 million annually.

Another example of the economic benefits of DfE is through an OEA grant to the Cardiac Surgery Business of Medtronic, Inc. The company reduced chemical use and wastewater loading by 75 to 80 percent for a coating process, resulting in annual savings of $2.1 million. The company also expects to reduce material use by 30 to 35 percent and industrial solid waste generation by 90 percent for a battery manufacturing process, resulting in a potential annual savings of over $200,000.

Recycling creates jobs and generates revenues

Minnesota's recycling industry adds significant value to our state's economy. More than two-thirds of the economic activity related to recycling is generated by remanufacturing secondary materials into new products. Recycling equals jobs. Based on a report done in 2000, Minnesota's value-added manufacturers generated an estimated $93 million in state tax revenue and employed an estimated 8,700 people in direct jobs. These jobs in turn support another estimated 20,000 people downstream in indirect and induced jobs. All together, these jobs pay an estimated $1.19 billion in wages.

If present recycling trends continue, by 2012, approximately 11,200 people will be employed in the value-added recycling manufacturing industry and $133 million will be generated annually in tax revenue. The tax revenue over the next 10 years would be $1.45 billion. If the *additional* 1.07 million tons of recyclable material that is thrown in the trash each year were recycled, by 2012 approximately 13,918 people would be employed in the value-added recycling manufacturing industry and $156 million in tax revenues would be generated annually. The tax revenue over the next 10 years would be $1.58 billion. (See Appendix B.)

In addition, if the organic portion of the waste stream presently going to waste facilities (896,457 tons) was recovered and composted, the total market value of this recovered material would be $12.1 million and would employ 1,874 people. (See Appendix B.)

Case study: Recycling asphalt shingles

High economic returns can be gained from the recycling of residential asphalt shingles into hot mix asphalt for road construction. Annually, an estimated 400,000+ tons of waste residential shingles from the Twin Cities region goes to construction and demolition landfills.

Businesses and government spend approximately $3.5 million on 5 million tons of hot mix asphalt annually. By investing $1.2 million in equipment to recover 190,000 tons of the waste residential shingles for use in 75 percent of the hot mixed asphalt, businesses and government would

- *save $2.8 million*
- *generate over $6 million in new gross business activity associated with recycling*
- *create 8 to 12 new jobs*
- *save approximately 200,000 to 300,000 cubic yards of space at C&D landfills*

Pending the implementation of a statewide program for the recycling of consumer electronics, the OEA estimates that approximately 115,500 televisions and 55,000 computer monitors could be collected and recycled in the initial stages of the program. Such recovery levels would divert between 680,000 and 1,193,000 pounds of lead from the waste stream. In addition, the OEA

projects collection volumes of 577,000 printers and 1.5 million CPUs annually from a statewide program. With the anticipated collection volumes, the OEA estimates an increase of employment of 400 to 500 employees at demanufacturing and initial processing facilities in Minnesota. This projection is based on existing levels of staff at processing locations and based upon projected volumes.

Discarded materials mean lost resources and lost revenues

In 2002, approximately 3 million tons of wastes were either processed or landfilled, at a cost of $146 million. Of this amount, approximately 1.07 million tons could still be recovered from the waste stream. Minnesotans discarded over $58.8 million of white paper, office paper, cardboard, mixed paper, and newsprint; $14.5 million of plastic containers; $12.6 million of aluminum and other metals, and $2.7 million of glass. These materials when recycled are worth $85 million at current market value. Instead, however, it cost roughly $45 million to manage these materials as waste rather than as resources. Once these materials are discarded, they can no longer generate future revenue streams, except for the materials that go to a waste-to-energy facility. Additionally, this is not the total picture. There are extensive subsidies on virgin materials nationally and statewide that reinforce the use of virgin materials over recycled materials in the manufacture of products. Virgin material subsidies are not reflected in the cost of disposal.

Treating waste as a resource saves money

Successful Minnesota businesses and organizations that are implementing *waste as a resource* not only protect the environment, but they also gain a competitive edge (Table 3-1). These companies were recently acknowledged by receiving a Governor's Awards for Excellence in Waste and Pollution Prevention. These awards honor superior environmental achievement by Minnesota's businesses, institutions, and public agencies.

Table 3-1. Examples of Minnesota companies using waste as a resource

Company/organization	Financial and resource savings
Dakota County and Independent School District 196 implemented a composting project for the entire district's non-recyclable organic waste.	• Approximately 800 tons of waste were source-separated by students and faculty and diverted for composting. • Improved waste sorting helped schools in the district increase the recycling rate for plastic bottles and paper by as much as 500 percent. • District saved 10 percent on cost of waste disposal in 2002-2003 school year due to increased recycling rates and decreased fees at compost facility.
Restore Refill Station refills plant-based, nonhazardous cleaning and personal care products into reusable bottles.	• Manufacturer saves over $1 per half-gallon by eliminating the bottle, cap, label, and labor associated with filling a bottle. • Reusing 5-gallon delivery pails saves $0.46 per half-gallon. • Eliminates expense of bottle and bottling costs. • Retailer eliminates stocking costs. • Gross profit margins in manufacturing with refillable bottles increase by 10 to 20 percent. • Increases retailer's gross profit margin to 35 percent of the refill price. • The consumer saves $1 for each bottle refilled.
Ramsey County Property Mgmt. recycled a 600,000-square-foot structure with a goal of recycling or reusing 80 percent of the building.	• Saved Ramsey County more than $500,000 in avoided disposal costs. • Reused and/or recycled 87percent of the building materials.

Recycling and organics recovery present challenges and opportunities

Counties and cities face numerous challenges with recycling and organics collection programs as a result of the poor economy and budget cuts. Rural recycling programs, in particular, are facing challenges to get materials to distant markets. Some counties are eliminating many or all of their rural recycling drop-off sheds and as a result (in some cases) are drastically reducing the opportunity for residents to recycle. For example, Olmsted County has eliminated its rural recycling drop-off shed program, and the county is also considering raising its waste-to-energy facility tip fee to offset cuts and pass some costs on to local governments. Clearwater County is planning to close its recycling center and cut recycling drop-off sheds from eight to two.

Some small rural counties in greater Minnesota are closing down recycling centers (or strongly considering such action) and limiting the types of materials they collect. Plastic and glass have been hit the hardest, and are being dropped in some communities. Four cities in Crow Wing County have dropped plastic recycling. For some counties, glass recycling is continuing only because it can be used in cover material at landfills and for berm construction. Norman County has recently authorized the closing of its recycling center, which also serves Polk, Mahnomen, and Clearwater Counties. Winona and Wabasha Counties have dropped out of the Southeast Materials Recycling Exchange (SEMREX), because of the costs. Marshall and Kittson Counties considered shutting down the KaMar recycling facility, but for now it is staying open.

Recent studies of organics projects have identified barriers and challenges related to the increased recovery of organic material from the waste stream. A combination of source-separated organics projects, such as the city of Hutchinson, Western Lake Superior Sanitary District, the Independent School District 196 project, and the 1995 Audubon pilot project, identified multiple barriers to organics recycling programs. In addition, a recent study by Washington County identified similar barriers to the grocery industry.

New organics programs that are just starting up face a number of challenges.

1. **Education.** In both the commercial/institutional and residential programs, it is critical to educate the participants about the types of materials that can be collected.
2. **Management support.** Training is needed at the beginning of a project and on an ongoing basis, especially in the restaurant industry due to the relatively high turnover rate in employees.
3. **Internal and external space needs.** Setting up systems to collect organic materials within a business or home and outside for the curbside collection can be difficult. Factors that impact these collection systems are sanitary conditions, biodegradable bags, space, and efficiency of collection.
4. **Collection systems.** The collection and transportation of organic materials to a management facility has been a major issue. Several different collection systems have been used in various programs in an effort to control collection costs. An issue impacting collection is whether there is organized collection or open hauling.
5. **Financial considerations.** Securing feedstocks is a critical element of any resource recovery project. With the loss of designation in 1994, all

How economics plays a role in recovery of organics

In November 2002, the Washington and Ramsey County Boards of Commissioners implemented a County Environmental Charge (CEC). Washington and Ramsey Counties, respectively, approved a 34.2 percent and 56 percent charge to be assessed to all businesses that generate waste in their counties. The CEC replaced a property-based waste management service charge, and the fee is now more directly related to volume. After the CEC was implemented, grocery stores made the business decision, without the county's assistance, to develop and implement an organics waste management system. This change in the prevailing economics for commercial waste generators created a new economic incentive for businesses rich in organic waste, such as grocery stores, to explore, evaluate, and develop organic waste management strategies.

facilities have relied on negotiated contracts or market participation through the use of contracted collection and financial incentives.

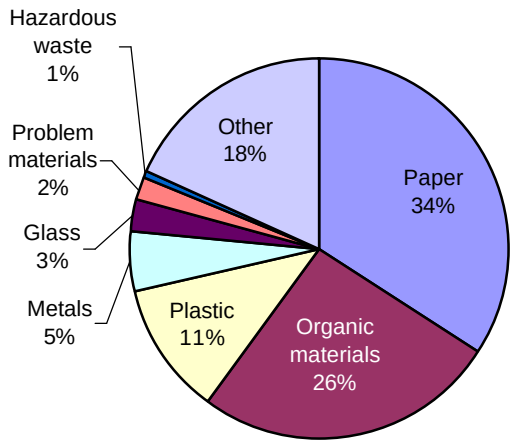
6. **Facility regulations.** All compost facilities in Minnesota, except for yard waste compost facilities and on-farm compost operations, must have an impermeable surface on which to compost materials and a storm water collection and treatment system. These requirements add considerable expense to the development of a compost facility and have been a significant barrier to the development of new facilities.

7. **Markets.** A serious barrier for compost has been the lack of markets for the finished compost. In the past four to five years, there has been a significant amount of research occurring at the national level that has shown that compost is an effective tool in preventing erosion on construction sites and has a positive impact on treating storm water runoff. Another market that has become available to compost facilities is the bagged market for retail sales of compost in garden stores. The biggest barrier to the higher-end markets (erosion control/water quality) is the difficulty of removing film plastic from finished compost. The use of biodegradable bags would alleviate this problem, however, biodegradable bags are as much as 10 times more expensive than non-biodegradable bags.

Notwithstanding, an on-site sort conducted in 1999 of waste materials going to waste processing facilities and landfills showed that there is considerable potential for improvement in county and city programs by collecting commonly recyclable and compostable products, such as paper, cardboard, and food waste (see Figure 3-3). Opportunities exist to recover organics from large-scale events and the commercial, industrial, and institutional sectors.

The study showed that approximately 34 percent of the recyclable portion of the waste is paper, 26 percent is organic materials, 11 percent is plastic, 5 percent is metals, and 3 percent is glass. Of the organic materials, nearly one-half is food waste. Treated wood accounts for 3 percent of the compostable portion, but this waste is not acceptable in organics management, due to its toxicity. By recovering these materials, we are treating waste as a resource.

Figure 3-3. Composition of MSW going to landfills and processing facilities, by category



Toxic materials and on-site disposal pose public health and environmental threats

By reducing or eliminating toxic materials from the waste stream, we protect solid waste facilities, their workers, and the public's health from potentially harmful effects of these materials. Reuse/full use, reduction, and source separation have been thoroughly documented as the least-cost methods of toxic material management. However, separating toxic materials from waste processing facility products, effluents, and emissions is expensive and sometimes not even possible.

MSW disposal of items such as pesticides, paints, household and commercial chemicals, electrical/electronic equipment, CRTs, batteries, treated wood, and mercury products have caused documented problems at Minnesota's MSW processing and disposal facilities. For example, MSW compost produced in the Minnesota has often been contaminated with pesticides, chlorinated organic chemicals (e.g., PCBs or PCB mimics), and heavy metals such as arsenic and lead, rendering the compost unusable. In the early 1990s, concerns were raised related to mercury

emissions from waste-to-energy facilities. Early efforts to beneficially reuse ash from Minnesota's MSW incinerators were hindered or prevented by the presence of arsenic, lead, and other toxic metals, sometimes at levels that turned the ash into hazardous waste. As a volatile metal, mercury may be emitted from MSW incinerators and may also be present in ash.

Toxics in the waste stream

To address these concerns of toxic materials contaminating the waste stream, Minnesota developed a multifaceted approach to removing these materials from the waste stream. First, the products that could be identified as causing contamination were banned from disposal. In some cases, such as mercury-containing batteries or thermometers, the product was banned from sale in Minnesota. The state worked with manufacturers to develop alternative products that do not contain toxic materials. The OEA's Design for Environment (DfE) work is an example of this effort. In other cases, the state ensured that the toxic materials were collected and recycled by the private industry. Lead acid batteries and nickel-cadmium rechargeable batteries are two examples of this approach. Work in similar areas continues through the state's product stewardship efforts. Products that could not be eliminated have been collected at household hazardous waste facilities.

Finally, for toxic materials that continue to be discarded in the waste stream, air and ash regulatory standards were raised to ensure that emissions do not allow toxic materials to be released into the environment. This resulted in the installation of additional air pollution control equipment at solid waste combustion facilities. Nationally, mercury emissions have been reduced by 93 percent and dioxin emissions by 99 percent following facility retrofits. Currently, all waste-to-energy facilities in Minnesota have tested their ash to determine whether or not it is hazardous. Ash from all waste-to-energy facilities has tested nonhazardous.

While efforts to remove and collect toxic materials prior to disposal and manage emissions from waste facilities have been successful and need to continue, more attention needs to be placed on reducing the toxicity of the waste. Collecting toxic products after their use does not prevent exposure to toxic chemicals during product use and disposal. Minnesota is committed to reducing toxic chemicals in products and promoting nontoxic alternatives. Reducing or eliminating toxic materials from products is the most economically efficient means of reducing the toxicity of the waste. Additionally, reduction or elimination of toxic products reduces the likelihood of public health and safety risks in the home and at solid waste facilities.

Backyard burning and on-site disposal

On-site disposal includes burning waste in barrels, fire pits, home incinerators, or on-site dumps. The on-site disposal of household garbage is banned in Minnesota, with the exception of farms and residences where regularly scheduled pick up of waste is not "reasonably available to the resident" (Minn. Stat. §§ 17.135 and 88.171). Some counties have passed "no-burn" resolutions that declare garbage service is available throughout the county and close this exemption for on-site disposal.

Current research indicates that open burning is far more harmful to our health and the environment than previously thought. It can increase the risk of heart disease, aggravate respiratory ailments such as asthma and emphysema, and cause rashes, nausea, and headaches. Open burning is also a significant source of pollution, including heavy metals and the production of volatile organic compounds (VOCs) and dioxin. Dioxin, a very potent carcinogen that can have dramatic impacts on human immune, developmental, and reproductive systems, is formed when materials such as plastic, paper, and other common household wastes are burned at low temperatures. Open burning of household waste in barrels is potentially one of the largest sources of airborne dioxin and furan emissions in the United States. The U.S. EPA estimates that one burn barrel (from an average family of four) can produce at least as much dioxin as a full-scale municipal waste incinerator burning 200 tons per day. Minnesota is producing nearly 50 pounds of dioxin per year from burn

barrel use—the equivalent dioxin output of 45,500 full-scale municipal waste burners burning 200 tons of waste per day in the state.[2]

Humans are generally most affected by dioxin from the air-to-leaf pathway and not necessarily from direct smoke inhalation. Dioxin bioaccumulates in animal fat, which is absorbed by people when they eat meat and dairy products. For other pollutants, such as fine particulates and polyaromatic hydrocarbons, inhalation is the pathway of greatest concern. Because residential garbage burning is more common in the rural, agricultural areas of the state, there is particular concern about the high levels of dioxin falling on croplands and concentrating in feed-crops and ultimately the livestock we consume (meat and dairy).

Based on SCORE data, the OEA estimates that as many as 100,000 households, or 5 percent of all households in Minnesota, disposed of 82,443 tons of MSW using on-site disposal methods (for the most part, using burn barrels) in 2002. "Problem materials not recycled" is OEA's estimate of the materials that are banned from disposal as MSW, but were most likely also dumped or burned on-site. This represents an additional 115,424 tons of waste tires, car batteries, appliances, oil, and oil filters. Together these categories account for 3.4 percent of the total MSW generated in Minnesota.

Backyard burning in northeast Minnesota

In a 2000 study of the northeast region conducted for the Western Lake Superior Sanitary District (WLSSD), survey responses showed that 18 percent of Minnesota residents in that area burn their household wastes on-site using a burn barrel or other means. When asked why they burn, residents most often cited convenience.

Resource recovery and landfill gas recovery offer energy alternatives

Minnesota's resource recovery system provides energy and economic development benefits to local communities. The resource recovery system produces 85 to 100 megawatts of power and generates 2.6 million pounds of steam per hour. Energy produced from MSW is renewable and can be generated 24 hours a day. It contributed to energy diversity. Currently 28 counties are served by resource recovery systems.

Minnesota's two largest waste-to-energy facilities are owned and operated by NRG Energy in Newport and Elk River, Minnesota. These plants accept waste from seven counties and convert it to refuse-derived fuel (RDF). The RDF is burned for energy at three converted power plants owned by Great River Energy and Xcel Energy. Over half of Minnesota's MSW waste-to-energy capacity is vested in these facilities. Hennepin Energy Resource Company (HERC) in Minneapolis uses a mass-burn technology to combust MSW. HERC is limited to burning 365,000 tons annually, but the design capacity is 442,380 tons per year.

Waste-to-energy facilities

- Polk County – serves industrial park with food processing businesses.
- Olmsted – serves the district heating and cooling needs of 25 buildings in downtown Rochester, the federal prison hospital, and county buildings.
- Fergus Falls – serves the State Regional Hospital and other government buildings.
- Pope Douglas – serves 3M's abrasives plant and Douglas County Hospital.
- Perham – provides steam to Tuffy's Pet Food manufacturing and Bongard's Creamery (pending).
- Red Wing – provides steam to the Red Wing shoe factory.

[2] Based on the U.S. EPA burn barrel research that began in the study "Evaluation of Emissions from the Open Burning of Household Waste in Barrels" in conjunction with Minnesota burn barrel data.

- Hennepin Energy Resource Company (HERC) – provides electricity to 26,000 homes and heating and cooling needs to the MTC garage.

Refuse-derived fuel facilities (utilizing RDF provided by NRG Energy)

- Great River Energy – provides electricity to 35,000 homes.
- Xcel-Wilmarth – provides electricity to 25,000 homes.
- Xcel-Red Wing – provides electricity to 25,000 homes.

Continued support is needed for current and new resource recovery facilities to reduce Minnesota's dependence on land disposal. Financial incentives to use resource recovery systems may be the best short-term approach.

At this time, several resource recovery projects are being considered:

- Expansion of the Olmsted County waste-to-energy facility.
- Future development of facilities in Pine County, Redwood County, and Tri-County North.

Landfill gas recovery systems

Currently there are four landfills in Minnesota that have gas-to-energy recovery systems in operation. In total, 24.2 megawatts of power is generated in Minnesota through landfill gas to energy recovery.

- Pine Bend landfill generates 12 MW and provides power to Xcel Energy.
- Burnsville landfill generates 4.2 MW and provides power to Xcel Energy.
- Elk River landfill generates 3.2 MW and provides power to Elk River Municipal Utility.
- Flying Cloud landfill (a closed landfill) generates 4.8 MW and provides power to Xcel Energy.

Part 4

Recommended Policies, Needed Research, and Proposed Strategies

In order to achieve the goals and objectives set forth in this document, the OEA has identified a number of solid waste policies that are discussed below. These policies include public and private actions intended to steer the solid waste system toward an overarching vision of *waste as a resource*. These policies are based on the premise that all waste generators, including governments, businesses, and citizens, take responsibility for the impacts of their production, purchasing, and waste management decisions. Research needs and strategies accompany each policy.

Evaluate the development of new goals and funding incentives to support waste reduction and waste as a resource

Evaluate an incentive-based SCORE Program

During the 2003 legislative session, the OEA was directed to develop recommendations for an incentive-based distribution approach for SCORE funding.

Policy: Evaluate and develop recommendations for an incentive-based distribution approach for SCORE funding.

> **Research needs.** Minnesota Session Laws, 2003 Chapter 128, Section 3 states that the OEA, in consultation with stakeholders, will develop and report to the legislative finance and policy committees with jurisdiction over the environment on an incentive-based distribution approach for SCORE funding to replace the allocation formula in Minn. Stat., § 115A.557, subd. 2. The office must submit preliminary recommendations by January 15, 2004, and final recommendations by January 15, 2005.
>
> **Strategies.** The OEA will meet with a group of stakeholders to evaluate the present SCORE funding structure and propose recommendations for an incentive-based program.

The 2002 Office of the Legislative Auditor's (OLA) Report on "Recycling and Waste Reduction" (available on OLA's web site at http://www.auditor.leg.state.mn.us/ped/2002/pe0201.htm) contained an evaluation of the SCORE program. In that report, the OLA conducted an audit of the SCORE program, evaluated its effectiveness, and made recommendations for improvement.

Policy. Evaluate the development of a new statewide/regional/county resource conservation goal, such as a waste abatement goal or a diversion goal that incorporates the various components of a solid waste system. Evaluate waste diversion in order to more comprehensively evaluate county or regional integrated solid waste systems and the environmental benefits and impacts.

> **Research needs.** The OEA will work with stakeholders and recommendations from the Legislative Auditor's report to improve SCORE reporting. Possible items to research include:
>
> - Reevaluate waste reduction and yard waste credits.
> - Update how source-separated composting, food-to-people, and food-to-livestock programs are tracked, measured, and evaluated.

- Include C&D and industrial waste totals in annual SCORE survey.
- Reevaluate problem materials and "problem materials not recycled" calculations.
- Develop a measurement system that provides an accurate accounting of residential versus commercial MSW to improve our understanding of waste reduction, recycling, and disposal/processing programs.

Preserve current state funding levels

Policy: Preserve current level of state funding to local units of government to fund integrated solid waste programs.

Strategies. Provide technical assistance to counties and support county initiatives to provide adequate funding for county waste reduction, reuse, and recycling programs (advance disposal fees such as the fee placed on pesticides, hauler collected fees, service fees, facility surcharges, etc.).

Policy: Build upon the successful models of providing resources to local units of government that can be used and promoted at a local level.

Research needs. Research successful strategies from other waste reduction efforts nationally.

Strategies

- Redeploy OEA's junk mail reduction campaign.
- Develop statewide materials that can be used and modified at a local level.
- Secure new partners and create new avenues to elevate awareness and provide practical tools to the residents in Minnesota.
- Launch at least one new residential waste reduction theme; the topics will be determined based on the latest waste sorts.

Recover recyclables and organics going to waste facilities

The waste composition study done in 1999 shows that approximately 26 percent of the waste that is going to processing facilities and landfills is organic material. This organic material has value and can be recovered and used in a variety of ways, including food to people and food to animals. By recovering organics from the waste stream, we are treating these materials as a resource. Composting yard waste and food waste ranks third in the waste management hierarchy. If these materials are separated prior to disposal, they can be recovered and used for food-to-people or food-to-animal programs, or be processed into compost that can be used as a high-quality soil amendment which may bring money back to the local community.

Remove collection and market barriers for organics recovery

Policy: Increase the amount of organic materials recovery (primarily food and non-recyclable paper) by removing collection barriers and increasing the quality of reusable food and high-quality compost.

Research needs

- Conduct research on ways to increase the value of finished compost by focusing on quality of finished product and identifying beneficial uses of compost.
- Work with appropriate stakeholders to identify barriers to the collection of organic materials and identify potential solutions to those barriers.
- Define organic materials, clarify the intent of solid waste tax exemption, and identify other potential incentives to increase the quantity of organics managed by recovery or composting.
- Conduct research to evaluate the benefits and drawbacks of bioreactors, such as the ones used in the treatment of sewage sludge, and compare and contrast them to landfill bioreactors.

Strategies

- The OEA will help programs that seek to increase recovery of organic materials, including capturing food waste from residential household, as well as from groceries, restaurants, manufacturing processes, events, schools, institutional cafeterias, and the horticulture/floral industries.
- The OEA will seek partners to implement collection of organic material for residential curbside and businesses such as restaurants and grocery stores.

Enhance public and private partnerships to increase the collection of additional recyclables, provide markets, and purchase recycled products

According to the waste composition study, approximately 37 percent of the waste that goes to processing facilities and landfills has the potential to be recycled. Materials include glass, metal, plastic, and paper, with paper representing the largest amount at 34 percent. If these materials are collected for recycling, strong markets need to exist to manage them. In order to ensure the success of these markets, consumers and businesses must purchase products with recycled content.

Policy: The state will partner with value-added manufacturers, local government, and waste service providers to collect additional post-consumer materials that are not currently being recycled. The state will support strong markets for local and national manufacturers of recycled products.

Research needs. Explore opportunities for rural cooperative marketing and research the need for a state recycling contract.

Strategies

- Provide assistance to start-up and expanding businesses in Minnesota that use recycled material in their products. Assistance includes technical, financial, and marketing support.
- Provide updated information for recycling markets to local units of government and the public.
- Develop a financial performance benchmark for recycling companies.
- Encourage grant applications that focus on technology for reducing contaminants in paper recycling.
- Continue to pursue new market opportunities for used carpet in the state.
- Continue to work with the EPA's Mid-America Council of Recycling Officials (MACRO) in the development of regionally effective programs and policies in recycling, recycling market development, and waste reduction.

Policy: State agencies should serve as models to local units of government and the public by purchasing environmentally preferable products.

Strategies

- Examine current state contracts for products and determine if their ingredients can negatively affect human health and the environment. Identify alternatives where possible.
- Work with the Department of Administration to create bid specifications to get more preferable products on the state contract.
- Offer training sessions to purchasing agents to educate them on these products and raise awareness of their existence.
- Track the amount of environmentally preferable products that are being purchased.
- Support efforts to increase the purchase of post-consumer recycled paper and re-refined motor oil.

Create opportunities with the manufacturing and business sectors for waste reduction and waste as a resource

Reusing, reducing, and eliminating the generation of waste often create significant cost savings by conserving raw materials and using resources more efficiently. Waste that is prevented at its source does not need to be managed or recycled, which means fewer costs and less pollution from transporting, recycling, processing, or landfilling wastes. Waste reduction helps sustain the longevity and economic viability of the state's waste management system.

Increase reduction, reuse, and recycling by commercial sectors

Policy: Reduction, reuse, and recycling efforts by non-residential sectors should be increased through technical assistance and financial incentives.

Research needs

- Refine sector priorities and characterize types and quantities of waste and materials generated by each sector.
- Research best management practices for each sector and compile relevant case studies.

Strategies

- The OEA, with assistance from several partners, will conduct outreach and deliver direct technical assistance to individual businesses and organizations. Partners include Minnesota Technical Assistance Program (MnTAP), Minnesota Retired Engineers Technical Assistance Program (RETAP), local governments, Minnesota Waste Wise, private consultants, and the Upper Midwest Solid Waste Group.
- Secure support of key trade and business associations and industry leaders.
- Incorporate recycling systems into new construction and remodeling projects.
- Implement office paper reduction communications initiative, including case studies on the OEA's recently awarded office paper grants.
- Accelerate the use and application of reusable transport packaging through technical and financial assistance.

- Contingent on available funding, design and implement the voucher incentive program whereby small monetary incentives are made available to individual businesses and organizations to implement recommended waste reduction, reuse, and recycling recommendations made by assistance providers.
- Work with local units of government to implement mechanisms such as volume-based pricing, hauler collected fees, etc. These activities range from carrying out more ambitious educational messages on waste reduction tactics to residential generators, to direct one-on-one technical assistance on reduction and reuse options for commercial/service and institutional entities.

Encourage generators to include incentives in waste hauling contracts

Currently, compensation for waste services is based largely on volume of waste collected and frequency of pickup. Language in contracts should realign incentives so that waste service providers have vested interests in assisting generators achieve waste reduction, reuse, and recycling, and are compensated accordingly.

Policy: Communities and commercial, service, and institutional generators should be encouraged to enter into contracts for waste services that include incentives to reduce, reuse, and recycle waste.

Research needs. Research application of resource management contracts, including case studies.

Strategies

- Through its grant program, the OEA will demonstrate the feasibility of resource management contracts through case studies and will present the approach to stakeholders to secure support and involvement.
- The OEA will work with counties and other public entities to employ resource management contract approaches in future waste management service Request for Proposals and bid specifications.
- The OEA will explore the use of tax credits and other financial incentives (e.g., preferential access to grants and loans) to generators who exercise a resource management contract approach.

Share in the responsibility for end-of-life product management

Product stewardship promotes the implementation of broad sustainability goals, through product redesign and end-of-life responsibility, pollution reduction, and energy and resource conservation. Product stewardship encourages people to think differently about the products they make, buy, and use, so that manufacturers, retailers, and consumers think about and treat products as resources rather than waste. Product stewardship means that everyone involved in designing, manufacturing, selling, and using a product takes responsibility for the environmental impacts of that product throughout every stage of its life. The OEA's product stewardship policy embraces the creation of partnerships between government and industry to reduce the environmental impacts of products.

Policy: The OEA will continue to work with manufacturers on targeted products to share in the responsibility of managing these products.

Research needs. Assemble background information about the effects of pharmaceuticals on the environment.

Strategies for carpet. Continue to participate with other states, the U.S. EPA, and the carpet industry to implement a 10-year schedule of recovery and recycling goals for carpet.

Strategies for paint. Support the paint industry, other state and local governments, U.S. EPA, and non-governmental organizations to negotiate a voluntary national paint stewardship agreement.

Strategies for beverage containers. The OEA will fulfill its obligation under an EPA grant to participate in a beverage container stewardship forum for state solid waste managers in 2004.

Strategies for automobiles. Through a grant from the U.S. EPA, the OEA will examine potential opportunities for product stewardship within the automobile industry by examining the following issues: evaluating materials currently used to manufacture and assemble automobiles, analyzing the environmental goals of manufacturers and their progress in meeting goals, assessing the impact of international regulations on domestic manufacturing practices, and identifying specific applications for parts containing recycled-content materials and assessing any barriers restricting the use of such parts.

Strategies for electronics

- Through a Plug-in to eCycling Pilot Project grant from the U.S. EPA, the OEA will develop partnerships with electronics retailers to test retail-based collection strategies at 12 to 20 locations statewide in the spring of 2004.
- Continue to participate in the National Electronics Product Stewardship Initiative (NEPSI), a multi-stakeholder dialogue involving 12 electronics manufacturers, 10 states, the federal government, and national environmental organizations. Its purpose is to reach agreement on a national system for collecting, reusing, and recycling electronics, and for financing that system.

Support Design for the Environment

Policy: Businesses will be encouraged to implement Design for the Environment (DfE) practices.

Strategies

- Continue to stimulate growth in the integration of DfE into product design by providing technical assistance, implementation grants, case studies, how-to guides, and industry peer-to-peer networking opportunities.
- Continue to work directly with major Minnesota manufacturers from diverse sectors to integrate DfE into their product design process. To date, these manufacturers have been from the medical, food processing, electric equipment, and electronic sectors. Large manufacturers will continue to be the initial focus of outreach, because in general, they have a greater capacity to put internal staff time toward integrating DfE into their product design process.

Promote new eco-industrial job zones that use waste as a resource

New challenges are facing Minnesota's solid waste systems, such as the emergence of new and different products and processes, economic factors, and new technologies. These new challenges need to incorporate the concept of waste as a resource and should consider the economic and energy benefits of new systems in an attempt to revitalize local economies.

Policy: As part of the integrated solid waste system, programs and facilities that use waste as a resource, such as organic facilities, value-added manufacturing facilities, new technologies, recycling facilities, and new resource recovery capacity, will be supported.

Research needs

- Prepare a rate-study analysis that creates better incentives for energy initiatives and promotes economic development and other opportunities.
- Determine the economic benefits of additional facilities that Minnesota may need to manage the organic material and recyclables that are currently going to landfills or waste-to-energy facilities.
- Evaluate, with stakeholder involvement, the effects of leachate recirculation projects at landfills.

Strategies

- Integrate eco-industrial concepts in the design of facilities that use waste as a resource. Encourage future facilities to explore locating in job zones.
- Develop integrated waste systems that include expansion of processing facilities, such as the Olmsted County waste-to-energy third line, burn capacity for Elk River and Newport RDF systems, and other new Metropolitan Area capacity.
- Support development of future processing facilities as part of an integrated waste system, such as the proposed waste-to-energy facilities in Lamberton, Sandstone, and Tri-County North that provide economic opportunities, enhance energy development and recovery, and improve the environment.

Reduce toxic materials and on-site disposal

The OEA will identify products that when disposed of create toxic emissions, releases, or contaminants. When these products become waste, they can create problems at landfills, incinerators, or compost facilities, or in residual streams (ash, compost, leachate) from those facilities. These products will be the focus of toxicity reduction and product stewardship efforts.

Remove toxics from the waste stream

Policy: Products and waste that result in emissions of toxic chemicals that affect air, water, and land should be identified and a plan developed to remove the materials from waste.

Research needs

- Use Problems Materials Plans, advisory groups, and other research and studies to identify "problem" products and waste that create toxic emissions, releases, or contaminants from solid waste facilities.
- Identify research gaps and conduct additional research where needed to identify sources of toxic materials.

Strategies

- Target "problem" products and wastes for reduction, elimination, source separation, and separate management, taking into consideration the type of waste management facility that the materials are destined for, or where they could be handled in a manner that reduces or eliminates toxic releases or contaminants.
- Utilize and expand, as appropriate, the state's existing HHW and VSQG programs for management of source-separated materials. Identify and address barriers to increased utilization and expansion.

- Plan for the proper management of high risk materials for which alternatives are available, including mercury and lead in automobiles, electronics, and other products; pesticides; dioxin reduction from burn barrels; pharmaceuticals; and treated lumber.
- Explore options for source separation of products/wastes known or suspected to cause problems at various types of waste management facilities.
- Encourage partial or full manufacturer responsibility for collection and proper management of "problem" products at high recovery rates. Evaluate incentives for elimination of toxics and designing for the environment.

Support initiatives that reduce toxics in products

Policy: Initiatives should be supported that reduce toxics in products, such as development of labeling standards, and promote consumer purchasing of alternative products that exhibit nontoxic characteristics.

Research needs. Study tools, such as "Fostering Sustainable Behavior" and others, to discover messages that are effective in changing behavior and purchasing habits of consumers.

Strategies

- Develop recommendations for labeling of consumer products that, if generated by a business, would be classified as hazardous waste.
- Currently the Material Safety Data Sheet (MSDS) discloses the presence of toxic substances to 1 percent. Over the next several years, the OEA will work with U.S. EPA and OSHA to evaluate lowering the MSDS disclosure of toxic substances to 0.01 percent.
- Evaluate the options for disclosure of inert ingredients in industrial and household chemicals.
- Work with local units of government to coordinate and develop appropriate messages that educate the public on toxicity reduction issues and alternatives to toxic products.
- Support initiatives, such as nontoxic building materials, that incorporate green building design into construction projects.

Eliminate on-site disposal

Policy: The elimination of on-site disposal should be promoted, including open burning.

Strategies

- The OEA will continue to work to reduce the threats from dioxin, heavy metals, and other pollutants created by residential garbage burning. Work will continue with WLSSD's regional education and reduction campaign, the Bi-National Toxics Strategy, and numerous local projects. The OEA will work with counties to educate residents about the health and environmental dangers of burn barrels and on-site disposal, help develop effective infrastructure and incentive programs, and work to pass local resolutions stating that garbage service is reasonably available.
- The OEA will work with legislators to introduce language during the 2004 session to eliminate on-site disposal and burn barrels as an option for mixed MSW.

Appendix A

Regional Profiles

In 2003, the OEA and county solid waste administrators conducted an analysis of solid waste systems in six geographic regions of the state. The analysis included waste and toxicity reduction programs, waste generation, recycling programs, organics programs, intercounty groups, processing, and landfilling, as well as a study of future challenges and opportunities in the region. To aid in the analysis of the needs and challenges in the regions, a series of maps were completed and reviewed. The maps in this appendix include: intercounty groups, waste generated by county, tons of recyclables collected by county, recycling rates by county, and waste destination facilities.

This appendix to the policy report provides a profile of existing solid waste systems in various regions of the state. In preparing this section, the counties were consulted on what they believe the future needs of their regions will be.

Workshop results

During the summer of 2003, six workshops with county representatives were held throughout the state to examine the current systems and look at future challenges in the regions. Nine common themes and statewide issues emerged from ideas given by the regional representatives, including:

1. **Dedicated solid waste fund.** All money collected for solid waste purposes, including tax collected on materials, should be used for its intended purpose (pesticide, tires, etc).
2. **Markets**
   - Lower-cost options for materials such as shingles and glass.
   - End markets need to be more economical and profitable.
   - Examine the possibility of a state contract for recycling that could be accessed by all public entities.
   - Find ways to lower transportation costs, including the idea of locating markets that are closer to the source.
3. **Toxicity reduction**
   - Increase funding for collection of pesticides and other materials.
   - Increase collection opportunities for very small quantity generators (VSQG) and small quantity generators (SQG) of hazardous waste.
4. **Product stewardship/producer responsibility.** Develop partnerships with manufacturers to share in the cost of managing wastes such as electronics, mercury, and packaging.
5. **Preserve existing landfill space and support existing and proposed waste-to-energy facilities.** Work to increase efficiency of existing facilities and ensure waste assurance mechanisms are in place.
6. **Revise SCORE measurement.** Suggestions include:
   - Give credit for source-separated organic material.
   - Find ways to get businesses to report recycling numbers.
   - Examine the idea of cost per capita for recycling programs.
   - Create incentives for increasing recycling rates.

7. **Evaluate the four major categories of recycling and decide if they are still relevant.** Examine the need to drop some materials and add others.

8. **Conduct a full cost accounting analysis** of recycling programs, including avoided costs.

9. **Update current rules and regulations.**

Profile: Southeast Minnesota

Southeast Minnesota consists of the following counties: Blue Earth, Brown, Dodge, Faribault, Fillmore, Freeborn, Goodhue, Houston, Le Sueur, Martin, McLeod, Mower, Nicollet, Olmsted, Rice, Sibley, Steele, Wabasha, Waseca, Watonwan, and Winona.

Intercounty groups

Several intercounty groups exist in southeastern Minnesota.

- **The Southeast Minnesota Recyclers' Exchange** (SEMREX) is a joint powers board working together on recycling and waste reduction issues. The organization began in 1989 as a group of county recycling staff that met to exchange ideas about recycling and solid waste matters. SEMREX has grown to include both public and private members, focusing on cooperative marketing, market development, and materials exchange.
- **The Southeast Multi-county Solid Waste Work Group** is an informal collection of six southeastern counties made up of solid waste officers and commissioners from Blue Earth, Rice, Waseca, Steele, Mower, and Freeborn Counties. This group meets on a quarterly basis to discuss solid waste issues, recycling, and reuse opportunities.
- **The La Crosse Disposal System** serves counties in the far southeastern region of Minnesota and southwestern Wisconsin. The La Crosse system is composed of a resource recovery facility, an MSW landfill, a demolition landfill, and a household hazardous waste facility. Waste supply contract extensions through the year 2023 were negotiated within the entire La Crosse Disposal System area. The only Minnesota county under contract until 2023 is Wabasha County. A contract is being negotiated with Houston County.
- **Olmsted and Dodge Counties** are currently involved in a 20-year joint powers agreement that expires in 2006. The agreement is intended to deal with waste management activities of interest to the two counties. Olmsted County operates an integrated solid waste management system that provides comprehensive solid waste services to Olmsted and Dodge Counties.
- **Freeborn-Mower**: Freeborn and Mower Counties participate in a solid waste joint powers board made up of county commissioners and solid waste officers. This board has assessed the prospect of developing a solid waste disposal facility in the past. At present, no plans to build a waste disposal facility are being considered. Mower and Freeborn Counties have entered into an agreement to collect household hazardous waste with a mobile collection unit and deliver the waste to the Mower County household hazardous waste facility. This contract establishes the procedure for delivering and handling household hazardous waste between the two counties.
- **Tri-County South** is a three-county joint powers board, which includes Le Sueur, Nicollet, and Sibley Counties. The Tri-Counties work together as a regional entity to upgrade solid waste management within their borders through waste education, household hazardous waste cooperation, and by contracting for recycling and waste services. Nicollet County is currently exploring the idea of building a materials recycling facility in partnership with the city of North Mankato for processing Nicollet County's recyclables. Waste generated within the Tri-Counties is currently transported to the Minnesota Waste Processing Company Transfer Station in Mankato.

Waste is taken from this facility to the Newport Resource Recovery Facility and processed into refuse-derived fuel for use at the Wilmarth NSP Power Plant in Mankato, with the residuals being deposited at the Ponderosa Landfill in Blue Earth County.

- **Prairieland Solid Waste Board** was established by Martin and Faribault Counties in 1989 through a joint powers agreement. The agreement authorizes the Prairieland Solid Waste Board to oversee the compost facility and to support other solid waste management activities within the two counties. The Prairieland mixed municipal waste composting facility is located in Truman, Minnesota, and was established nearly 10 years ago.

Waste and toxicity reduction programs

There are 21 household hazardous waste facilities in southeastern Minnesota. The Olmsted County regional facility serves Goodhue, Wabasha, and Dodge Counties. Winona County serves Fillmore and Houston Counties. Blue Earth County serves Brown, Faribault, Le Sueur, Martin, Nicollet, Sibley, and Watonwan Counties. Mower County serves Freeborn County. Rice County serves Steele and Waseca Counties. Most of the HHW facilities also have product exchanges.

Winona County Habitat for Humanity ReStore is a building materials center for new and used building materials. Overstocked, discontinued, or slightly damaged items, as well as used materials and equipment, will be donated for resale to the public. Habitat for Humanity received a $40,000 grant from the OEA based on the project's ability to divert construction materials that would have otherwise been disposed of in a landfill.

Recycling programs

SEMREX is a cooperative marketing group that consists of Blue Earth, Dodge, Freeborn, Mower, Olmsted, Rice, Steele, and Waseca Counties.

Organics facilities

There is one mixed municipal solid waste compost facility in southeastern Minnesota. This facility, known as Prairieland, is located in Truman, Minnesota, and received 11,262 tons of waste in 2002. Waste is received from Martin, Faribault, and Blue Earth Counties.

The city of Hutchinson in McLeod County operates a source-separated organics facility. This facility accepts yard waste and separated food waste. In 2002, the facility composted 2,124 tons of waste. Numerous local units of government have yard waste collection programs.

Current waste generation

In 2002, the region generated a total of 830,018 tons of mixed municipal waste. Of this amount, 381,986 tons were recycled, 121,672 tons were processed, and 300,260 tons were sent to landfills.

Processing facilities

Waste that was generated in 2002 in the southeastern region of the state was sent to the following resource recovery facilities (RRF) and waste-to-energy (WTE) facilities:

Facility name	SE MN tons/year	Location	Counties sending waste
Olmsted County WTE	61,614	Rochester, MN	Olmsted, Dodge
NRG French Island WTE	12,681	La Crosse, WI	Fillmore, Houston, Wabasha, Waseca
NRG Energy Newport RRF	32,471	Newport, MN	Blue Earth, LeSueur, Brown, Martin, Nicollet, Rice, Waseca, and Sibley
Red Wing WTE	14,906	Red Wing, MN	Goodhue and Wabasha
Total	**121,672**		

Land disposal

Waste that was generated in southeastern Minnesota in 2002 was sent to the following municipal solid waste landfills.

Facility name	SE MN tons/year	Location	Ownership	Counties sending waste
Kalmar (Olmsted County)	31,862	Rochester, MN	Public	Dodge, Olmsted
Spruce Ridge	26,959	Biscay, MN	Private	McLeod, Sibley
Cottonwood County	189	Windom, MN	Public	Blue Earth, Watonwan
Brown County	11,590	Olivia, MN	Public	Brown
Ponderosa (Blue Earth County)	8,792	Mankato, MN	Public	Blue Earth, LeSueur, Nicollet, Faribault, Waseca, Watonwan
WMI-Burnsville Landfill	650	Burnsville, MN	Private	Le Sueur, Sibley
Rice County	33,336	Dundas, MN	Public	Rice, Goodhue
Steele County	17,563	Blooming Prairie, MN	Public	Steele, Freeborn, Waseca
Onyx-7 Mile Creek	16,986	Eau Claire, WI	Private	Winona, Goodhue
WMI-Spirit Lake	55,904	Spirit Lake, IA	Private	Blue Earth, Le Sueur, Nicollet, Sibley, Faribault, Watonwan
WMI-Timberline Trail	16,043	Ladysmith, WI	Private	Winona, Goodhue
WMI-Central Disposal	77,531	Lake Mills, IA	Private	Fillmore, Freeborn, Martin, Rice, Mower, Steele, Waseca, Winona
Winneshiek County	1,996	Decorah, IA	Public	Fillmore
La Crosse County	859	La Crosse, WI	Public	Houston
Total	**300,260**			

Challenges, opportunities, and priorities

- **Olmsted County's third line for the resource recovery facility.** The third line is expected to be on-line in mid-2007 and will increase the capacity of the Olmsted waste-to-energy facility by 200 tons per day—doubling the current capacity.
- **Southeast Minnesota/Wisconsin grant for interstate cooperation.** This grant, executed in June of 2003, was awarded to Foth & Van Dyke and matched by the La Crosse Disposal System. The grant will help identify solid waste projects that could benefit from interstate collaboration with La Crosse and neighboring counties, select a project for possible collaboration, and analyze/recommend a governance style that could best support regional solid waste collaboration.
- **Rural cooperative marketing.** Support is needed to continue the Southeast Minnesota Recyclers' Exchange (SEMREX) through regional cooperation and grant opportunities.
- **Dodge County compost facility.** In 2001, Dodge County received a CAP grant from OEA to install an MSW composting facility. The facility is planned to be operational by April 2004. When fully functional, the facility will process up to 1,500 tons of MSW per year.
- **Freeborn-Mower Counties.** As part of the Mower and Freeborn Counties' Solid Waste Management Plan updates, both counties have recognized that there is a potential for development of a food waste composting program due to the large number of food processing businesses in the area. Private industry will be encouraged to take the lead, and program development will be explored over the next couple of years through the establishment of a Solid Waste Advisory Committee, current staff, and assistance from the OEA and generators from private industry.
- **Greenhouse gas study.** The OEA is administering a grant to Olmsted County in conjunction with R.W. Beck & Associates to update and improve the current "Goal-Volume Table" spreadsheet used in county Solid Waste Management Plans that predicts future waste generation in all waste streams for individual counties. The grant also provides for the addition of an "environmental benefits" section that will link to data in the waste generation prediction section of the spreadsheet. This spreadsheet addition will quantify environmental benefits, such as energy and material resources conserved and greenhouse gases avoided for each county, based on their unique program configuration. This will give counties a tool that shows them the positive impact(s) that their particular solid waste system is having on the environment. It will also help local decision makers and staff assess the overall success of their solid waste programs in light of the benefits produced, and assist them in planning future solid programming.
- **Southern Minnesota Construction (SMC).** Southern Minnesota Construction in Mankato has discussed plans for a materials exchange center located in Mankato. SMC has begun collecting reuseable items and is primarily interested in demolition and construction materials. Items such as plywood, sheet rock, wiring, lumber, piping, cabinets, countertops, tin work, molding, and fixtures. SMC has trucks that regularly travel a wide area in southern Minnesota and would be willing to collect materials from area counties.

Profile: Southwest Minnesota

Southwest Minnesota consists of the following counties: Big Stone, Chippewa, Cottonwood, Jackson, Kandiyohi, Lac Qui Parle, Lincoln, Lyon, Meeker, Murray, Nobles, Pipestone, Redwood, Renville, Rock, Swift, and Yellow Medicine.

Intercounty groups

The Southwest Regional Solid Waste Commission is a joint powers board consisting of Cottonwood, Jackson, Lac Qui Parle, Lincoln, Lyon, Murray, Nobles, Pipestone, Redwood, Renville, Rock, and Yellow Medicine Counties. The commission was organized to provide the greatest public service benefit for the entire 12-county area in planning, management, and implementation of solid waste management.

The goal of the Southwest Regional Solid Waste Commission is to foster an integrated approach to solid waste management in the region and follow the order and preference of waste management strategies identified in the Minnesota Waste Management Act.

Waste and toxicity reduction programs

There are two regional household hazardous waste facilities in southwestern Minnesota. The Kandiyohi regional facility serves Big Stone, Chippewa, Kandiyohi, Lac Qui Parle, Meeker, Renville, and Swift Counties. The Lyon County regional facility serves Cottonwood, Jackson, Lincoln, Lyon, Murray, Nobles, Pipestone, Redwood, Rock, and Yellow Medicine Counties. The HHW facilities also have used product exchange programs.

The commission received a grant in 2003 for a staff person to oversee several regional waste reduction and recycling projects. This person is based out of Lyon County and will be targeting specific industries with education and a recognitions program.

Recycling programs

Most counties have very aggressive recycling programs, which typically include county and municipal contracts for curbside collection and collection at rural recycling sheds. The majority of businesses arrange for their own recycling services.

There are eight materials recovery facilities in the region, where recyclables are processed and marketed: four are privately owned and operated, while four are publicly owned and operated.

Organics facilities

There is one mixed municipal solid waste compost facility in southwestern Minnesota, which is located in Swift County near Benson. In 2002, the facility processed 1,916 tons of waste from Swift County. Numerous local units of government have yard waste collection and management programs.

Transfer stations

There are approximately eight transfer stations in southwest Minnesota. Four transfer stations are publicly owned and operated, while the other four are privately owned and operated.

Current waste generation

In 2002, the region generated a total of 232,184 tons of mixed municipal waste. Of this amount, 73,041 tons were recycled, 1,916 tons were processed, and 128,337 tons were sent to landfills.

Land disposal

Waste that was generated in southwestern Minnesota in 2002 was sent to the following municipal solid waste landfills:

Facility name	SW MN tons/yr	Location	Ownership	Counties sending waste
Kandiyohi County	27,693	Willmar, MN	Public	Kandiyohi
Cottonwood County	8,125	Windom, MN	Public	Cottonwood, Murray, Redwood
Waste Connections	14,685	Rushmore, MN	Private	Nobles, Rock
Renville County	8,965	Olivia, MN	Public	Renville, Redwood
Lyon County	40,285	Lynd, MN	Public	Lac Qui Parle, Lincoln, Lyon, Pipestone, Redwood, Rock, Yellow Medicine
WMI-Elk River	4,560	Elk River, MN	Private	Meeker, Swift
WMI-Gwinner	2,362	Gwinner, ND	Private	Big Stone, Meeker, Swift
WMI-Spirit Lake	13,525	Spirit Lake, IA	Private	Chippewa, Jackson, Meeker, Murray
WMI-Spruce Ridge	5,998	Biscay, MN	Private	Lac Qui Parle, Meeker
Roberts County	139	Sisseton, SD	Public	Big Stone
Total	**128,337**			

Challenges, opportunities, and priorities

- **A waste-to-energy facility in Lamberton, Minnesota.** The facility will convert MSW to steam and approximately 6 megawatts of electrical energy. Facility design also includes a materials recovery facility that will remove remaining recyclables from the incoming MSW waste stream. The facility is currently seeking commitments from 17 counties in southwest and south-central Minnesota for waste delivery and is conducting secondary investigations of the project's feasibility.
- Regional development
- Public awareness for elementary and middle schools

Capacity issues

If the waste-to-energy facility is not built, MSW will likely continue to be landfilled in the region and in neighboring states. Without additional landfill expansion, permitting, and issuance of Certificate of Need for existing southwestern Minnesota landfills, a greater quantity of MSW will be most likely be disposed of in out-of-state landfills in the coming years.

If the proposed waste-to-energy facility is built, it will be able to handle the majority of MSW generated in the region, as well as increase recyclables recovery, while generating energy. Development of the facility will also present several economic development opportunities for the region.

Profile: Metropolitan Area

The Metropolitan Area consists of the following counties: Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington.

Intercounty groups

The Solid Waste Management Coordinating Board (SWMCB), formed in 1990, is a joint powers board composed of two county commissioners from the counties of Anoka, Carver, Dakota, Hennepin, Ramsey, and Washington. To enhance intergovernmental coordination, the board also includes the director of the Minnesota Office of Environmental Assistance (OEA) and the manager of the Minnesota Pollution Control Agency's (MPCA) Metro Division as ex-officio members. The mission of SWMCB is to increase the efficiency and environmental effectiveness of the region's solid waste management system.

Waste and toxicity reduction programs

Each of the metropolitan counties has at least one year-round site for the collection of HHW and most augment that site with seasonal, temporary, satellite, or special one-day collections. These sites operate pursuant to an agreement between the counties and the OEA that addresses financial risk and a Reciprocal Use Agreement that allows residents to use any of the HHW collection sites located in the six Metro Area SWMCB counties.

Reuse programs. The Metropolitan Area offers many reuse programs, including a web-based Free Market, the Reuse Center, and individual county reuse programs.

Recycling programs

Collectively, the metropolitan region's recycling rate was 46.3 percent, a drop from 49 percent in 1996. However, total tons recycled increased from 1.2 tons in 1996 to 1.3 million tons in 2002. There are three firms that operate materials recovery facilities in the Metropolitan Area. Materials recycled in 2002 came from the following sources: 73 percent from commercial, industrial, and institutional, 23 percent from residential, and 4 percent from mechanical/hand-sort recycling.

Organics facilities

Yard waste in the region is managed through county, municipal, and private programs. Two counties operate yard waste collection sites. Municipalities or private firms sponsor most yard waste sites. There are numerous food-to-people and food-to-hog programs in the Metro Area. Endres Processing processes food waste into animal feed. NRG Processing Solutions processes organic waste, including paper products, into mixed compost. In 2002, the region delivered 964 tons to NRG Processing Solutions.

Current waste generation

Municipal solid waste generation grew from 2.8 million tons in 1996 to nearly 3.4 million tons in 2002. The metropolitan region generates 58 percent of the total waste generated in the state.

Processing facilities

There are three waste processing facilities in the region: Hennepin Energy Resource Company (HERC), Ramsey/Washington County Resource Recovery Facility (NRG Energy Newport), and Elk River Resource Recovery Facility (NRG Energy-Elk River).

Facility name	Metro tons/year	Location	Counties sending waste
NRG Energy-Elk River RDF	270,108	Elk River, MN	Anoka, Carver, Dakota, Hennepin, Scott
Hennepin Energy Resource Co. (HERC)	360,919	Minneapolis, MN	Carver, Dakota, Hennepin, Scott
NRG Energy Newport RDF	327,551	Newport, MN	Carver, Dakota, Hennepin, Ramsey, Washington
Total	**958,578**		

Landfilling

Waste that was generated in the metropolitan area in 2002 was sent to the following municipal solid waste landfills:

Facility name	Metro tons/year	Location	Ownership	Counties sending waste
WMI-Burnsville	182,378	Burnsville, MN	Private	Carver, Dakota, Hennepin, Ramsey, Scott, Washington
WMI-Elk River	226,092	Elk River, MN	Private	Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, Washington
BFI-Pine Bend	404,175	Inver Grove Heights, MN	Private	Carver, Dakota, Hennepin, Ramsey, Scott, Washington
WMI-Spruce Ridge	41,637	Biscay, MN	Private	Carver, Hennepin
WMI-Central Disposal	124,092	Lake Mills, IA	Private	Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, Washington

Onyx-7 Mile Creek	68,681	Eau Claire, WI	Private	Anoka, Carver, Hennepin, Ramsey, Scott, Washington
BFI-Sarona	72,559	Sarona, WI	Private	Anoka, Carver, Hennepin, Ramsey, Washington
WMI-Timberline Trail	594	Ladysmith, WI	Private	Dakota
Total	**1,120,208**			

Challenges, opportunities, and priorities

- Contracts with processing facilities (NRG Newport and Elk River)
- Management of organic waste
- Beneficial reuse
- Ash utilization
- Public collection
- Get recycling back to basics—add more materials, may need to drop some

Profile: Central Minnesota

Central Minnesota consists of the following counties: Chisago, Isanti, Kanabec, Mille Lacs, Pine, Benton, Crow Wing, Morrison, Sherburne, Stearns, and Wright.

Intercounty groups

East Central Solid Waste Commission: The counties of Chisago, Isanti, Kanabec, Pine, and Mille Lacs established a joint powers agreement in 1988 to provide for the management of solid waste. The commission is a vehicle by which the participating counties plan and execute regional waste disposal and waste abatement options. The commission owns a materials recovery/composting facility, two transfer stations, and a landfill.

Tri-County North: The Tri-County Solid Waste Commission includes Stearns, Benton, and Sherburne Counties. The commission is responsible for coordinating solid waste management activities within those three counties. Other duties include: administration of waste facility and waste hauler contracts; management of a regional HHW program; and coordination of select cooperative waste education, waste reduction, and recycling projects.

Waste and toxicity reduction programs

There are four permanent household hazardous waste facilities in central Minnesota. The Tri-County group in Stearns County serves Benton, Douglas, McLeod, Pope, Sherburne, Stearns, Chisago, and Wright Counties. Crow Wing, Morrison, and Todd Counties have formed their own region. The HHW facilities also operate a used product exchange.

In 1999, Cass, Crow Wing, and Hubbard Counties received a grant from the OEA to establish a materials exchange program, which is now known as the North Central Materials Exchange (MATEX).

Organics facilities

There are two closed mixed municipal solid waste compost facilities in central Minnesota: one in Wright County and one in Kanabec County. Many local units of government have yard waste collection and management programs.

Current waste generation

In 2002, the region generated a total of 565,691 tons of mixed municipal waste. Of this amount, 213,122 tons were recycled, 81,349 tons were sent to processing facilities, and 242,382 tons were sent to landfills.

Processing

Waste that was generated in the central region of the state in 2002 was sent to the following resource recovery facilities (RRF) and waste-to-energy (WTE) facilities:

Facility name	Central MN tons/year	Location	Counties sending waste
NRG Energy-Elk River RDF	76,780	Elk River, MN	Benton, Sherburne, Stearns
Perham WTE	2,049	Perham, MN	Stearns
Fergus Falls WTE	2,520	Fergus Falls, MN	Stearns
Total	**81,349**		

Land disposal

Waste that was generated in central Minnesota in 2002 was sent to the following municipal solid waste landfills:

Facility name	Central MN tons/year	Location	Ownership	Counties sending waste
East Central Solid Waste Commission	66,947	Mora, MN	Public	Chisago, Isanti, Kanabec, Mille Lacs, Pine
WMI-Timberline	1,083	Ladysmith, WI	Private	Chisago
Crow Wing County	41,832	Brainerd, MN	Public	Crow Wing
WMI-Elk River	97,123	Elk River, MN	Private	Mille Lacs, Benton, Crow Wing, Sherburne, Stearns, Wright
Morrison County	22,025	Little Falls, MN	Public	Morrison
WMI-Central Disposal	10,352	Lake Mills, IA	Private	Wright
WMI-Spirit Lake	3,020	Spirit Lake, IA	Private	Stearns
Total	**242,382**			

Challenges, opportunities, and priorities

- Preservation of existing landfills in Morrison and Crow Wing Counties.

- Evaluate new waste-to-energy facilities in Sandstone and Tri-County North.
- MPCA's leachate recirculation pilot project in Morrison and Crow Wing Counties.

Profile: Northwest Minnesota

Northwest Minnesota consists of the following counties: Kittson, Roseau, Lake of the Woods, Marshall, Pennington, Red Lake, Polk, Norman, Mahnomen, Clearwater, Beltrami, Clay, Becker, Wilkin, Otter Tail, Grant, Traverse, Stevens, Todd, Wadena, Hubbard, Cass, Pope, and Douglas.

Intercounty groups

- **Mar-Kit:** Marshall and Kittson Counties formed the Mar-Kit joint powers group in 1991. The other counties have long-term, 15-year contracts, which run through 2010, with Mar-Kit for use of the facility (MRF and landfill).
- **KaMar:** Kittson, Marshall, and Roseau comprise the KaMar joint powers group, which owns and operates the recycling operation in each of the member counties and has a materials recovery facility, collection trucks, and collection bins. The amount of ownership and funding by each county is calculated by population.
- **Perham:** This group consists of Otter Tail, Wadena, Todd, and Stearns Counties and contracts with the city of Perham for a waste-to-energy facility. The city of Perham meets with contracted counties monthly to share information and ideas on the operation of the facility.
- **Polk Group:** Polk County owns and operates a waste-to-energy facility and an up-front materials recovery facility. Polk County has long-term contracts with Beltrami, Clearwater, Mahnomen, and Norman Counties for use of the facility. This group meets monthly, or as needed, to discuss plant operations and share information.
- **Fergus Falls Group:** The city of Fergus Falls owns and operates a waste-to-energy facility. The city has long-term contracts with Otter Tail, Stevens, Grant, Traverse, Wilkin, and Stearns Counties for use of the facility. The city meets with contracted counties several times a year, or as needed, to share information on the plant operations.
- **Pope-Douglas:** Pope-Douglas is a joint powers group for all solid waste management in the two counties. The group owns and operates a waste-to-energy facility with an up-front materials recovery facility and ash landfill, contracts for recycling in both counties, and operates a satellite household hazardous waste facility.

Waste and toxicity reduction programs

There are three regional household hazardous waste facilities in northwestern Minnesota. The northwest Minnesota group has a permanent facility in Bagley, which serves Beltrami, Cass, Clearwater, Kittson, Lake of the Woods, Marshall, Pennington, Polk, Red Lake, and Roseau Counties. The Becker group has a permanent facility in Detroit Lakes and serves Becker, Clay, Hubbard, Mahnomen, Norman, and Wadena Counties. The western Minnesota group has a permanent facility in Fergus Falls and serves Grant, Otter Tail, Stevens, Traverse, and Wilkin Counties. The HHW facilities also conduct a used product exchange.

There are several reuse programs in the northwest region of Minnesota. The Clay County group, which consists of Clay, Becker, and Wilkin Counties, has a program that reuses and recycles

demolition and construction debris. Hubbard County has a demolition, construction, and furniture reuse program.

Recycling program

Collectively, the recycling rate in 2002 for northwestern Minnesota is 37 percent. There are 16 materials recovery facilities in the region.

Organics facilities

There were two MSW compost facilities in the northwest region of Minnesota. In 2002, SWIS/Pennco Facility in Thief River Falls processed 4,915 tons of waste from Marshall and Pennington Counties. This facility closed operations in August 2002. The Lake of the Woods compost facility in Graceton discontinued operations in 2001. Numerous yard waste facilities exist in the region.

Transfer stations

There are approximately 20 transfer stations: 16 are publicly owned and four are privately owned.

Current waste generation

Counties in the northwest region of Minnesota generated 401,104 tons of mixed municipal solid waste in 2002. Of this, 149,233 tons were recycled, 103,619 tons were processed, and 134,938 tons were sent to landfills.

Processing facilities

Waste that was generated in northwest Minnesota in 2002 was sent to the following resource recovery facilities (RRF) and waste-to-energy (WTE) facilities:

Facility name	NW MN tons/year	Location	Counties sending waste
Fergus Falls WTE	26,234	Fergus Falls, MN	Grant, Otter Tail, Stearns, Stevens, Traverse, Wilkin
Polk County RRF	27,038	Fosston, MN	Beltrami, Clearwater, Mahnomen, Norman, Polk
Perham WTE	23,406	Perham, MN	Otter Tail, Stearns, Todd, Wadena
Pope-Douglas WTE	25,069	Alexandria, MN	Pope, Douglas
Elk River RRF	1,872	Elk River, MN	Pope, Douglas
Total	**103,619**		

Land disposal

Waste that was generated in northwest Minnesota in 2002 was sent to the following municipal solid waste landfills:

Facility name	NW MN tons/year	Location	Ownership	Counties sending waste
MarKit	23,639	Hollock, MN	Public	Kittson, Koochiching, Lake of the Woods, Marshall, Red Lake, Roseau
WMI-Gwinner	25,158	Gwinner, ND	Private	Becker, Beltrami, Clay, Otter Tail, Wilkin, Hubbard, Wadena
Clay County	22,895	Hawley, MN	Public	Clay
Kandiyohi County	1,233	Willmar, MN	Public	Stevens
Roberts County	519	Sisseton, SD	Public	Traverse
City of Grand Forks	16,327	Grand Forks, ND	Public	Marshall, Pennington, Polk
City of Fargo	6,129	Fargo, ND	Public	Becker
WMI-Wisheck	4,922	Wisheck, ND	Private	Becker, Wadena
WMI-Elk River	29,286	Elk River, MN	Private	Cass, Hubbard, Itasca, Otter Tail, Todd, Wadena, Pope, Douglas
Polk County	3,737	Fosston, MN	Public	Clearwater, Mahnomen, Norman, Polk
WMI-Spruce Ridge	1,093	Biscay, MN	Private	Pope, Douglas
Total	**134,938**			

Construction and demolition landfills

There are 34 demolition landfills under permit in the northwest region of Minnesota: 24 are publicly owned facilities, and 10 are privately owned facilities.

Challenges, opportunities, and priorities

- Maintain operation of waste-to-energy facilities (Pope-Douglas, Fergus Falls, Perham, Polk). WTE facilities need to remain competitive to landfills.
- Tire processing/shredding at MarKit landfill.
- HHW/materials exchange facility in Hubbard County.
- Convert compost facility in Pennington County to transfer station, recycling center, and materials recovery facility.
- Interstate cooperation with North Dakota.
- Organics management programs in Becker, Hubbard, and Beltrami Counties.
- Possible tire pyrolysis facility in Moorhead.

Capacity issues

Capacity for the management of mixed municipal solid waste is limited in this region. The Mar-Kit landfill is the only facility that could handle more waste, but they are not actively looking for additional waste. Currently, all existing waste-to-energy facilities are running at near or full capacity. The waste-to-energy facilities have contracts with counties that can provide additional waste on an as-needed basis. The need for additional waste is primarily seasonal, during the winter months.

Profile: Northeast Minnesota

Northeast Minnesota consists of the following counties: Aitkin, Carlton, Cook, Itasca, Lake, Koochiching, and St. Louis Counties and the Western Lake Superior Sanitary District (WLSSD).

Intercounty groups

NEWAC: The Northeast Waste Advisory Council is a regional task force that was formed early in 1991 for the purpose of evaluating regional solid waste management options that make sense economically and environmentally. The council, which meets quarterly, includes representatives from the WLSSD and from Aitkin, Carlton, Cook, Lake, Itasca, Koochiching, and St. Louis Counties. Each county is represented by a solid waste officer, staff, a commissioner, and alternate who serve on the governing board of NEWAC.

Waste and toxicity reduction programs

There are six regional household hazardous waste facilities in northeastern Minnesota. The Western Lake Superior Sanitary District's permanent and mobile household hazardous waste facility located in Duluth serves Aitkin, Carlton, Cook, Itasca, Koochiching, Lake, and St. Louis Counties. St. Louis

County operates two household hazardous waste facilities and its own mobile collection program. The facilities also operate a used product exchange.

All counties within the Arrowhead Region have waste reduction education programs that help promote alternatives to HHW and its proper management. These activities range from HHW technical assistance to businesses, to collection event announcements on public access television and in newspapers, to presentations at schools and community group meetings. Furthermore, two counties provide the public a HHW product exchange drop-off program where products (i.e. latex paint, automotive supplies) that are in the original container and in good condition are left for someone else's potential use.

Recycling program

There are 17 materials recovery facilities in the region: 10 are privately owned and operated, five are publicly owned and operated, and two are publicly owned but privately operated.

Organics facilities

The WLSSD Organic Waste Compost Facility is designed with a capacity of 7,900 tons or 31,200 cubic yards per year, an average of 120 cubic yards per day. In 2002, the facility processed 359 tons of organics from the district. Approximately half of the volume is designed to be source-separated organic materials and the other half is yard waste. There are numerous yard waste facilities in the region.

Transfer stations

There are approximately 10 transfer stations in northeast Minnesota: eight are publicly owned and operated, and two are privately owned and operated.

Current waste generation

Counties in the northeast region of the Minnesota generated 320,120 tons of mixed municipal solid waste in 2002. Of this, 151,711 tons were recycled, 359 tons were processed, and 179,102 tons were sent to landfills.

Processing facilities

The only processing facility in this region is the source-separated organics facility in WLSSD. In 2002, the facility processed 359 tons of organics.

Land disposal

Waste generated in northeastern Minnesota in 2002 was sent to the following MSW landfills:

Facility name	NE MN tons/year	Location	Ownership	Counties sending waste
St. Louis County	50,568	Virginia, MN	Public	St. Louis, Lake, Koochiching

BFI-Sarona	89,075	Sarona, WI	Private	Carlton, Cook, Lake, WLSSD
MarKit	7,854	Hollock, MN	Public	Koochiching
WMI-Elk River	29,455	Elk River, MN	Private	Itasca, Aitkin
East Central Solid Waste Commission	2,150	Mora, MN	Public	Aitkin
Total	**179,102**			

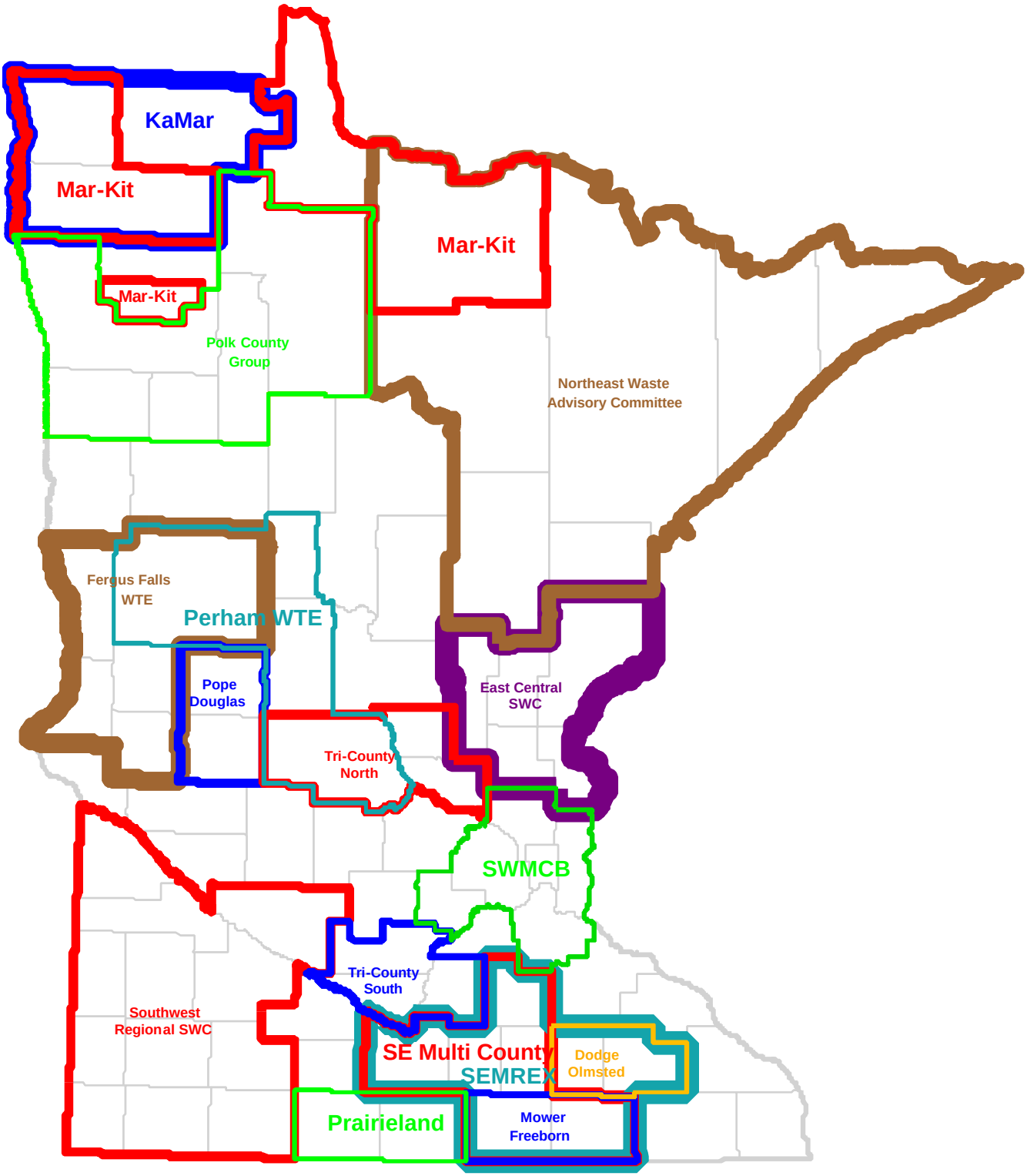
Construction and demolition landfills

There are 14 construction and demolition landfills that are in operation. Seven of these facilities are publicly owned and operated, while 10 are owned and operated by private companies.

Challenges, opportunities, and priorities

- Opportunities for C&D management, industrial waste management, and beneficial reuse.
- Support for organics projects at WLSSD and the proposed St. Louis County facility in Ely.
- Disposal options for problem materials such as treated wood, furniture, mattresses, tires, and fluorescent lamps.
- Options for rural solid waste collection services.
- Interstate cooperation with Wisconsin.
- Managing tourism waste with programs such as “Recycling/Garbage on the Go.”
- Insufficient landfill capacity.

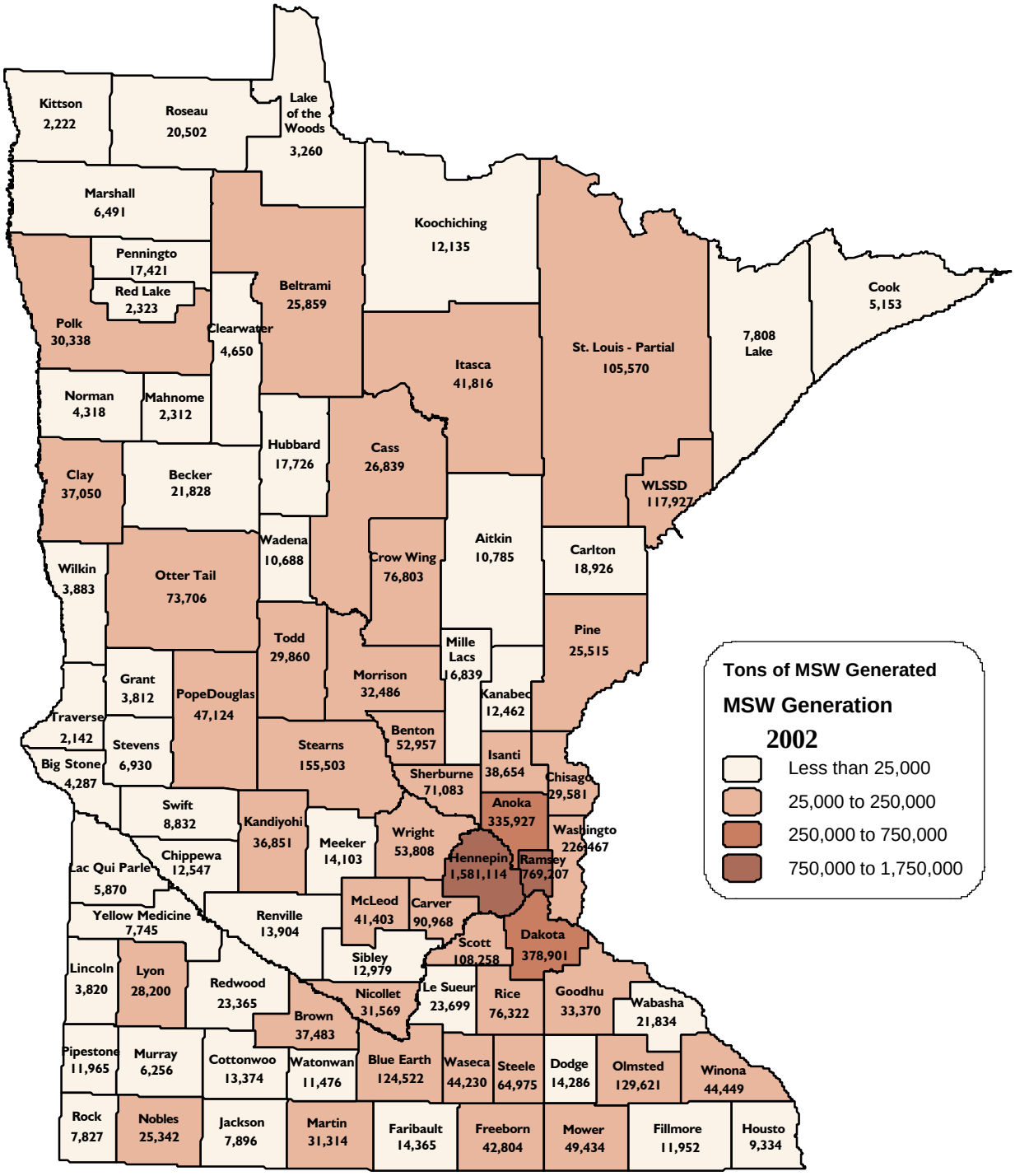
Figure A-1. Intercounty regional groups



Intercounty regional solid waste groups

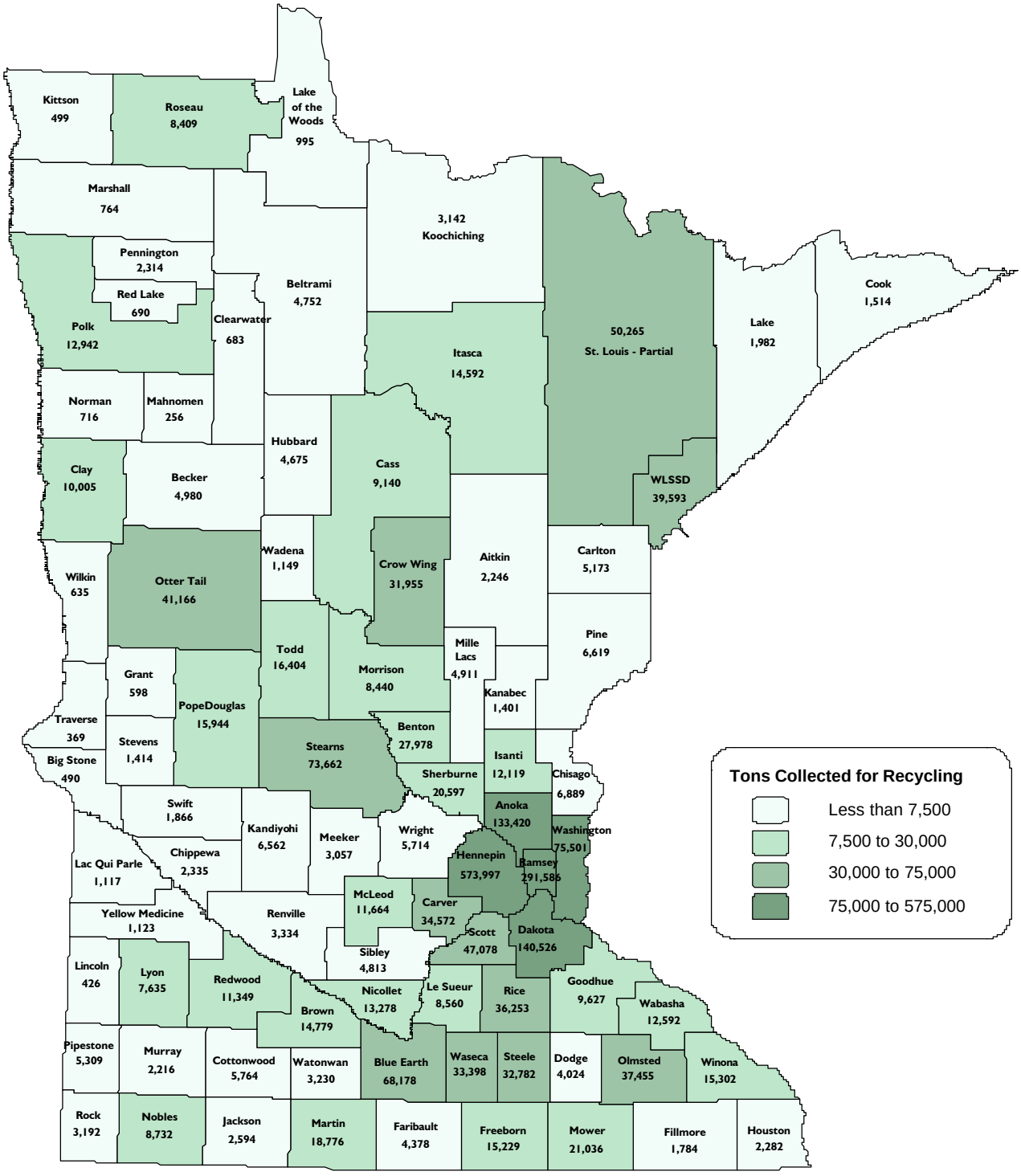
Group	Counties	Type	Services
East Central Solid Waste Commission	Pine, Kanabec, Mille Lacs, Isanti, Chisago	Joint powers	Regional operations, landfilling, education
Tri-county Solid Waste Commission (South)	Sibley, Nicollet, LeSueur	Joint powers	Planning, recycling, landfilling
Tri County Solid Waste Commission (North)	Stearns, Benton, Sherburne	Joint powers	Regional operations, RDF, incineration
Dodge-Olmsted	Dodge, Olmsted	Joint powers	Regional operations, waste-to-energy, landfilling
Northeast Waste Advisory Council	Cook, Lake, St. Louis, Carlton, Koochiching, Itasca, Aitkin, WLSSD	Informal: Commissioners and SWAs	Regional planning, education, HHW, workshops, problem materials
Pope-Douglas	Pope, Douglas	Joint powers	Waste-to-energy, regional planning, HHW, education, problems materials, landfilling
KaMar	Kittson, Marshall, Roseau	Joint powers	Recycling, education, waste reduction
Polk County Group	Beltrami, Clearwater, Mahnomen, Norman, Polk	Contract and board	Waste-to-energy, landfilling, transfer stations
Perham WTE Group	Otter Tail, Wadena, Todd, Stearns	Contract	Waste-to-energy
Fergus Falls WTE Group	Otter Tail, Grant, Stevens, Traverse, Wilkin	Contract	Waste-to-energy
Southwest Regional Solid Waste Commission	Lac Qui Parle, Yellow Medicine, Lincoln, Lyon, Redwood, Pipestone, Murray, Cottonwood, Rock, Nobles, Jackson	Joint powers/ contract	Planning, education,
Prairieland	Martin, Fairbault	Joint powers	MSW composting, RDF
Freeborn-Mower	Mower, Freeborn	Joint powers	Planning
Mar-Kit	Marshall, Kittson, Red Lake, Koochiching, Lake of the Woods	Joint powers	Landfilling
SE Multi-county Solid Waste Work Group	Freeborn, Rice, Stele, Mower, Waseca, Blue Earth	Informal: Commissioners and SWAs	Planning
Solid Waste Management Coordinating Board	Anoka, Carver, Dakota, Hennepin, Ramsey, Washington	Joint powers	Planning, education, RDF, landfilling, reduction, recycling
SEMREX	Blue Earth, Dodge, Freeborn, Mower, Olmsted, Rice, Steele, Waseca	Joint powers	Cooperative marketing, market development

Figure A-2. Waste generated by county, 2002



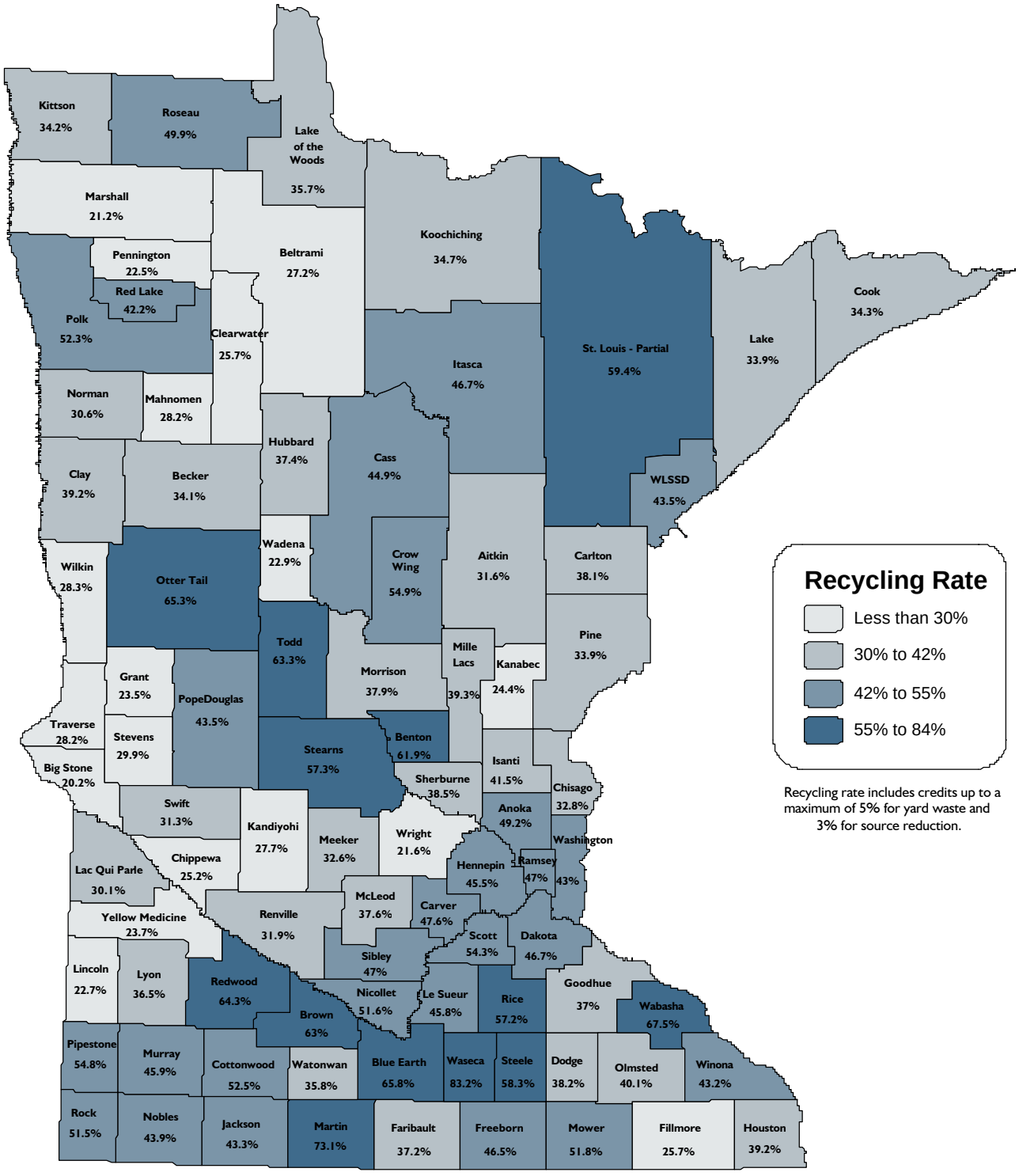
Data Source: 2002 SCORE Survey of Counties, Office of Environmental Assistance, 2003.

Figure A-3. Tons of recyclables collected by county, 2002



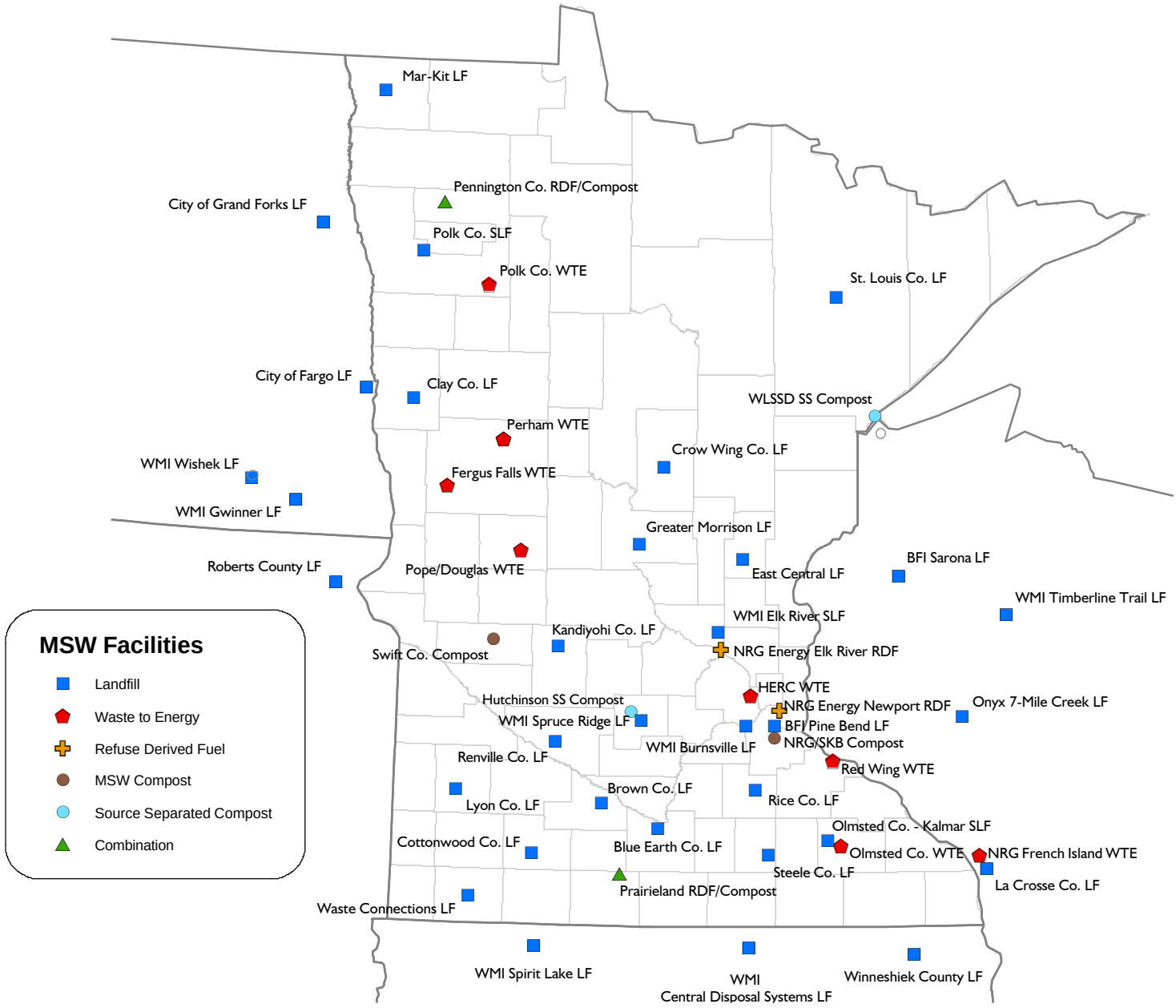
Data Source: 2002 SCORE Survey of Counties, Office of Environmental Assistance, 2003.

Figure A-4. Recycling rates by county, 2002



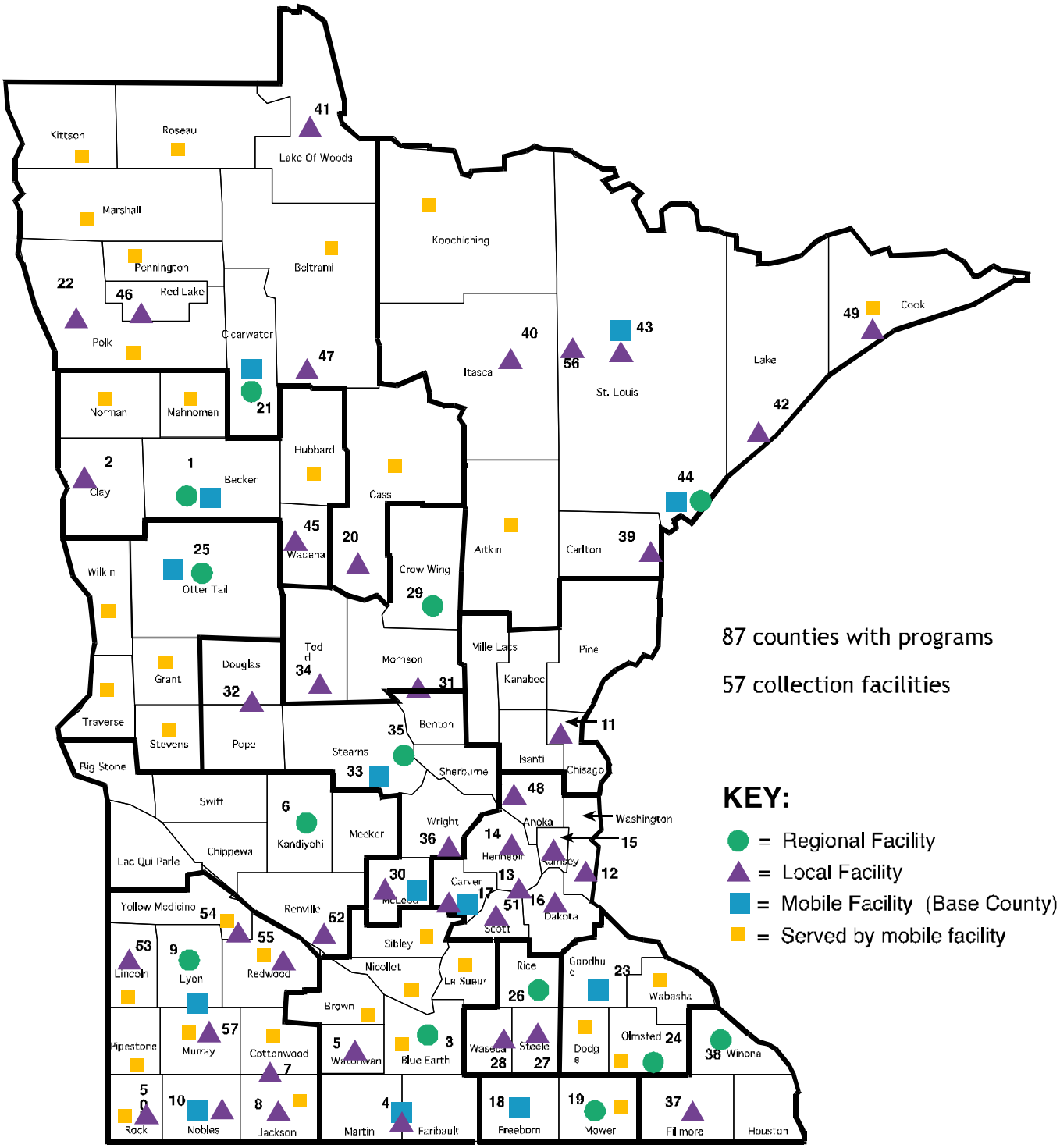
Data Source: SCORE Survey of Minnesota Counties, Office of Environmental Assistance 2003

Figure A-5. MSW destination facilities, 2002



Data Source: Minnesota Office of Environmental Assistance 2003

Figure A-6. Household Hazardous Waste facilities in Minnesota, 2003



Appendix B

Market Value of Recyclables and Organic Materials

Table B-1. Potential market value of organic materials disposed of in 2002

Materials	Percent waste sent to disposal facilities	Tonnage estimate
Yard waste: grass	2.1%	71,000
Yard waste: woody material	0.2%	7,000
Food waste	12.4%	419,000
Nonrecyclable OCC	0.5%	17,000
Nonrecyclable mixed paper	9.2%	311,000
Diapers	2.1%	71,000
Totals	**26.5%**	**896,000**

Total potential market value of additional recovered materials: $12,100,000

Potential new jobs: 1,870

Assumptions:

- *In 2002, Minnesota waste haulers collected and transported 3,383,000 tons of mixed municipal solid waste to disposal facilities.*
- *The compost per-ton market value is based on an average of sales with 50% as a bulk compost and 50% as a bagged compost.*
- *The 2003 market value of bulk compost is $15 per ton, and the market value for bagged compost is $30 per ton.*
- *There is a proven substantial market demand for additional compost.*
- *The total compost market value potential is based on recovery of 60% of the gross tonnage at a $22.50 per ton average price.*
- *Job creation potential is based on Hutchinson's jobs-to-total-tonnage-throughput of 11 jobs for 5,262 tons.*

Table B-2. Estimate of recyclable materials available for recovery in 2002

Materials	Waste composition percentage	Available tonnage	Market value $ per ton	Market value potential	Data source
Newsprint	4.1%	139,000	$44	$6,100,000	*Official Board Markets,* 10-27-2003
High-grade office paper	3.0%	101,000	$175	$17,700,000	*Official Board Markets,* 10-27-2003
Uncoated OCC	6.8%	230,000	$66	$15,200,000	*Official Board Markets,* 10-27-2003
Mixed paper boxboard	9.0%	304,000	$65	$19,800,000	*Official Board Markets,* 10-27-2003
PET	0.6%	20,000	$324	$6,500,000	*Waste News,* 10/27/2003
HDPE	0.5%	17,000	$368	$6,300,000	*Waste News,* 10/27/2003
Other plastic containers	0.5%	17,000	$100	$1,700,000	*Waste News,* 10/27/2003
Aluminum beverage containers	1.2%	41,000	$91	$3,700,000	*Waste News,* 10/27/2003
Ferrous containers	2.9%	98,000	$53	$5,200,000	*Waste News,* 10/27/2003
Other ferrous	0.9%	30,000	$25	$800,000	*Waste News,* 10/27/2003
Clear containers	1.3%	44,000	$50	$2,200,000	Anchor Glass, 2003
Green containers	0.3%	10,000	$5	$100,000	Anchor Glass, 2003
Brown containers	0.4%	14,000	$35	$500,000	Anchor Glass, 2003
Recyclable potential	**32.0%**	**1,065,000**		**$85,800,000**	

Table B-3. Potential market value by material category

Paper	$58,800,000
Plastic	$14,500,000
Ferrous cans	$6,000,000
Aluminum beverage containers	$3,700,000
Glass	$2,800,000
Total	**$85,800,000**