REPORT TO THE LEGISLATIVE COMMISSION ON WASTE MANAGEMENT

SOLID WASTE PROCESSING AND DISPOSAL: CAPACITY, COMPETITION, FEES AND PROGRESS

Submitted by

The Minnesota Pollution Control Agency

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MINNESOTA POLLUTION CONTROL AGENCY

520 Lafayette Road

St. Paul, Minnesota 55155

Pursuant to Mn Stat 115A.981, sd 3

EXECUTIVE SUMMARY

SOLID WASTE PROCESSING AND DISPOSAL: CAPACITY, COMPETITION, FEES AND PROGRESS

EXECUTIVE SUMMARY

> The agency shall report to the legislative commission on waste management by July 1 of each year on the viability of the state's waste processing and disposal capability, the status of competitive forces in the market including recycling, composting, waste reduction and incineration, the extent to which existing fees for services are sufficient for facility development, engineering, environmental and safety factors, the progress of the industry in meeting the state's waste management goals, and recommendations for regulations to ensure protection of human health and the environment. In preparing the report, the agency shall consider information received under subdivision 2.
>
> Minn. Stat. § 115A.981, subd. 3.

A. The Viability of Solid Waste Processing and Disposal Capability

Viability is related to resource scarcity. If resources are adequate to meet defined needs, then the system is considered viable.

Capability is related to capacity. If permitted facilities have approved capacities sufficient to manage all solid wastes, then the system is considered to be capable of doing its job.

Minnesota now has about 16 million cubic yards of solid waste to manage in a year (see Figure 1). A number of different methods are used to manage solid wastes. Land disposal is the most extensively used method. The landfilled part of the waste stream is declining in absolute value and relative to other waste processing methods.

Solid waste processing and disposal activity is concentrated in population centers (see Figure 2). The Twin Cities region generates, processes, and disposes of about 60 percent of all solid wastes.

The annual total costs of solid waste management are estimated to be between $700 million and $1 billion. This cost is between 3/4 and 1 percent of the state's total economic output, or $160 to $240 per capita per year. Minnesota's economic resources are adequate, in the short-term, to manage solid wastes. Long-term economic capacity is subject to business cycle changes, but most solid waste management firms should be able to operate through all but the worst of recessions. Costs will continue to escalate even if economy declines, so solid waste management could be a growing part of the state's output.

FIGURE 1

TOTAL SOLID WASTE MANAGED

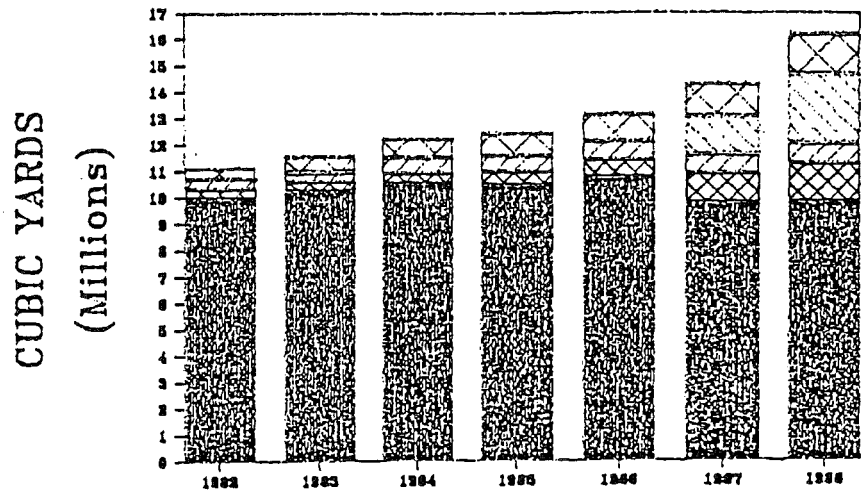
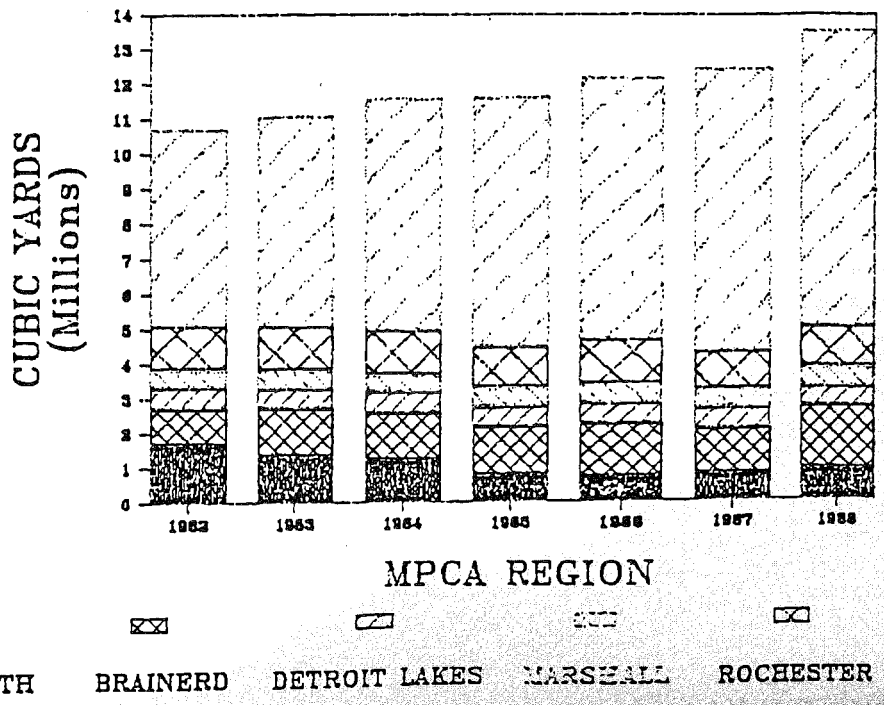


FIGURE 2

REPORTED S.W. PROCESSING & DISPOSAL



Most solid waste management facilities have permits that fix capacity. Processing facilities have permits that fix the rate of solid waste handling (e.g., X tons per day or per year). Disposal facilities have permits that fix available space (e.g., X cubic yards or acre/feet).

The solid waste management system now has processing and disposal capacity sufficient to meet short-term needs.

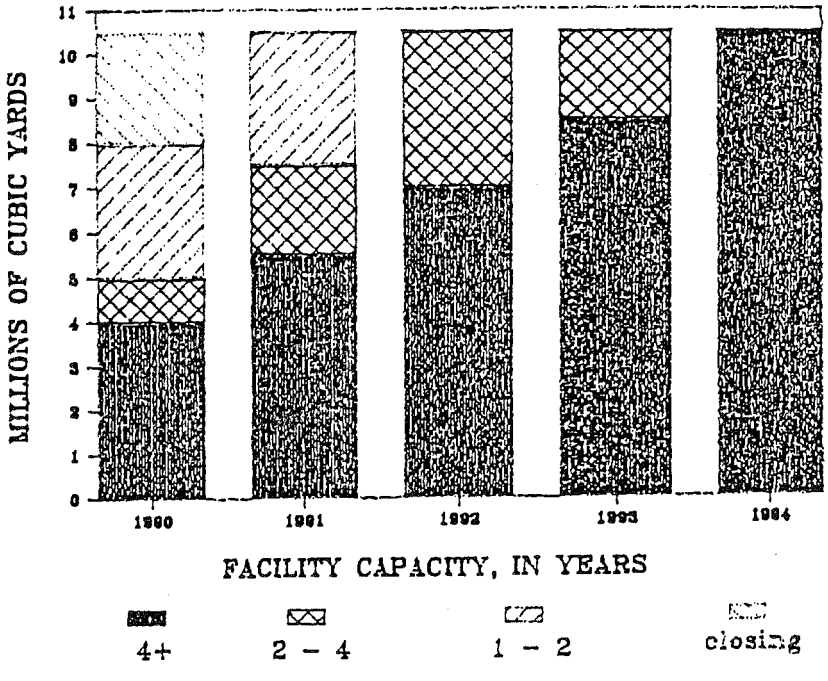
MIXED MUNICIPAL LAND DISPOSAL FACILITIES

Remaining Capacity	1988 Waste Receipts (c.y.)	Annual Average (c.y.)
4+ years	5,524,679	4,089,718
2 - 4 years	1,012,258	991,252
1 - 2 years	2,447,068	3,192,687
closing	857,447	2,640,050

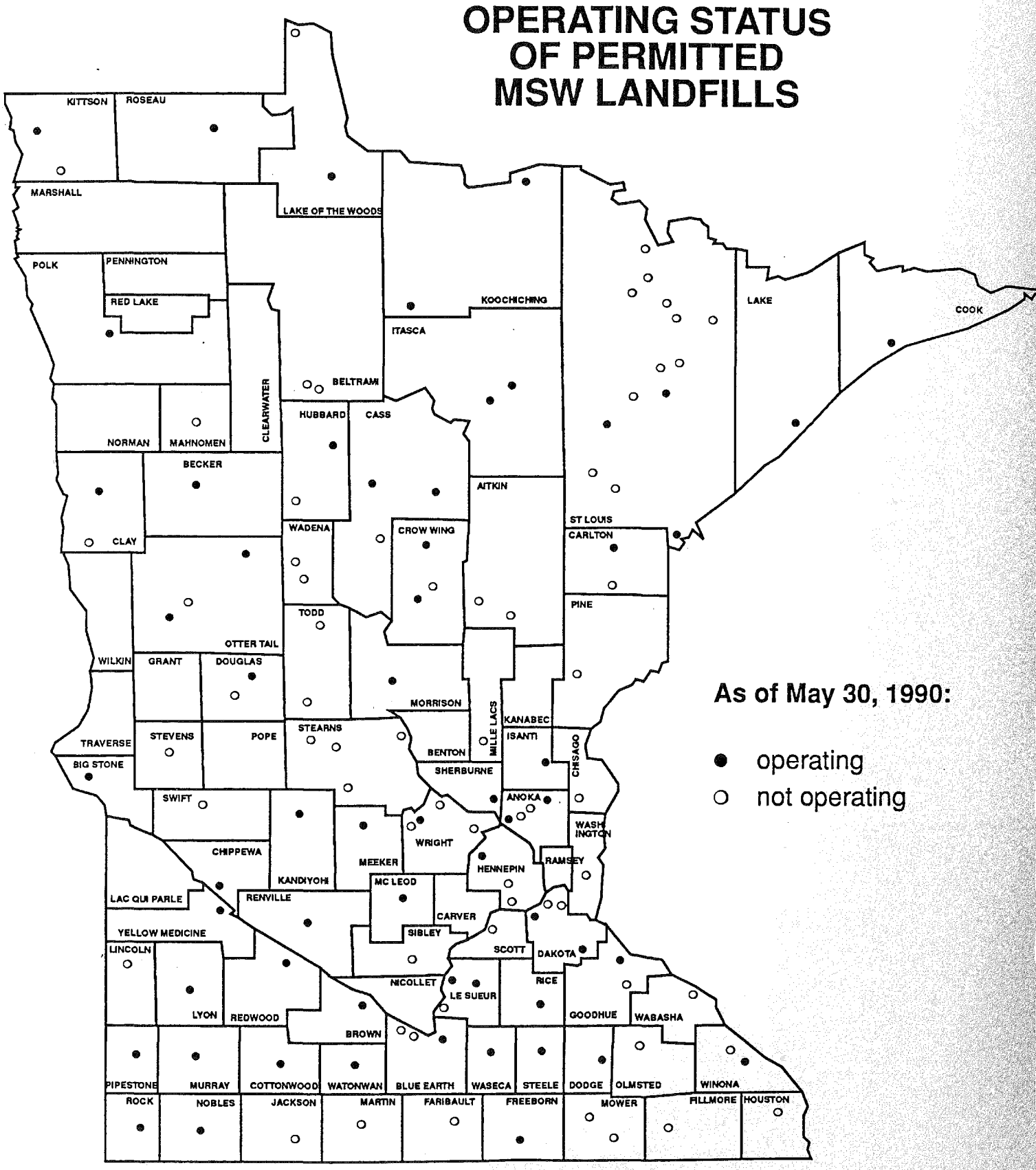
The facilities with the most capacity are the ones that will be operating through the short-term. Smaller facilities are now closing. (The map on the following page shows the current status of land disposal facilities.) The average rate of waste receipts is up for the two-year to four-year plus facilities, which means they are filling up at a faster rate. Even though they are receiving waste at a faster rate, the larger facilities that are now operating probably have enough space to operate through the short-term. However, long-term disposal capacity is uncertain (see Figure 3).

FIGURE 3

SHORT-TERM CAPACITY SCHEDULE



OPERATING STATUS OF PERMITTED MSW LANDFILLS



As of May 30, 1990:

- ● operating
- ○ not operating

So, the capacity demands are increasing for mixed municipal solid waste (MSW) land disposal facilities that now have enough space to operate for four or more years. New capacity for MSW land disposal facilities now takes five to seven years to develop. Increased incineration, recycling and composting activity will ease the strain, but the demand for new long-term disposal capacity will remain.

B. Competition in the Solid Waste Management Sector

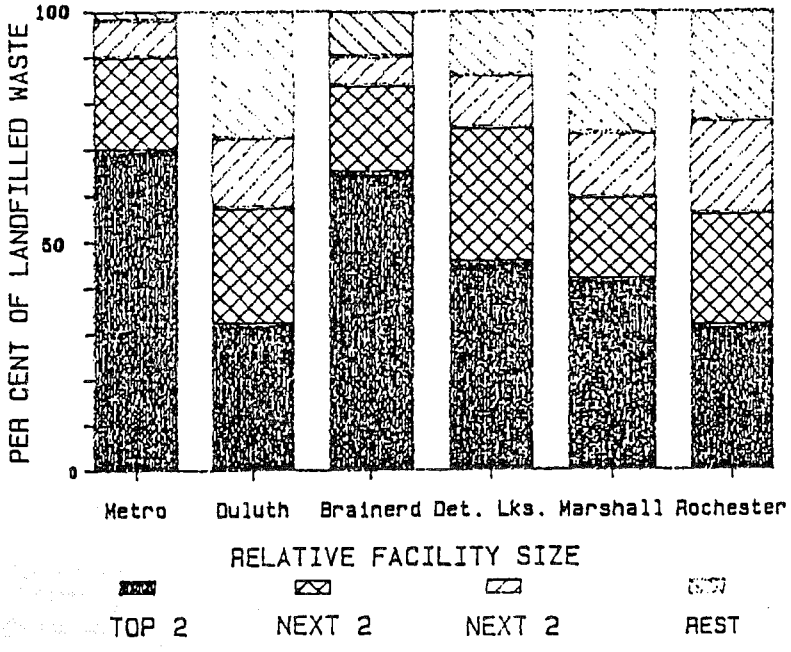
Minnesota Pollution Control Agency (MPCA) records show that 159 currently operating solid waste management facilities have applied for and received permits. This includes 88 MSW land disposal facilities. About 30 of these facilities are expected to close this summer. The MPCA has received notice that 40 yard waste compost facilities are now operating. The MPCA estimates that about 170 recycling facilities are now operating. Estimates of the number of private waste collection firms range from 500 to 850.

Disposal facility numbers have declined in recent years, a trend which is expected to continue. This has led to a concentration of disposal capacity in some regions (see Figure 4).

FIGURE 4

MARKET SHARES OF MMSW LANDFILLS

(1988)



Market concentration is not a complete indicator of competition in the solid waste management sector. Regional and local waste flow regulations have sharply limited competitive forces in the metropolitan region and in a few regions outside the Twin Cities.

Competition is reported to be increasing among recycling firms, although this competition may be limited to higher-valued materials, such as aluminum. Recyclers confront limits in their competitive positions because landfill prices generally do not include all charges for long-term care. Narrative reports are mixed with respect to competition among waste collection firms. Some report that waste haulers compete fiercely; others report that waste haulers dictate prices. These reports follow no clear regional pattern.

C. The Adequacy of Solid Waste Management Fees

Fees reported in 1989 by MSW land disposal facilities range from $3 to $20 per cubic yard. The weighted average fee was about $11.50 per cubic yard.

Fees reported in 1989 by MSW resource recovery facilities range from $13.80 to $28.50 per cubic yard. The weighted average fee was about $18 per cubic yard.

Financial management practice varies throughout the solid waste management sector. Many facilities earn all revenues from fees. Some facilities receive partial or full subsidies from local governments.

Regardless of local fee levels, there are some indirect solid waste management costs that are not covered by fees. These are a) the costs of state subsidies for alternative solid waste management systems, and b) the costs of corrective action for MSW land disposal facilities.

D. Progress Toward Meeting Statewide Solid Waste Management Goals

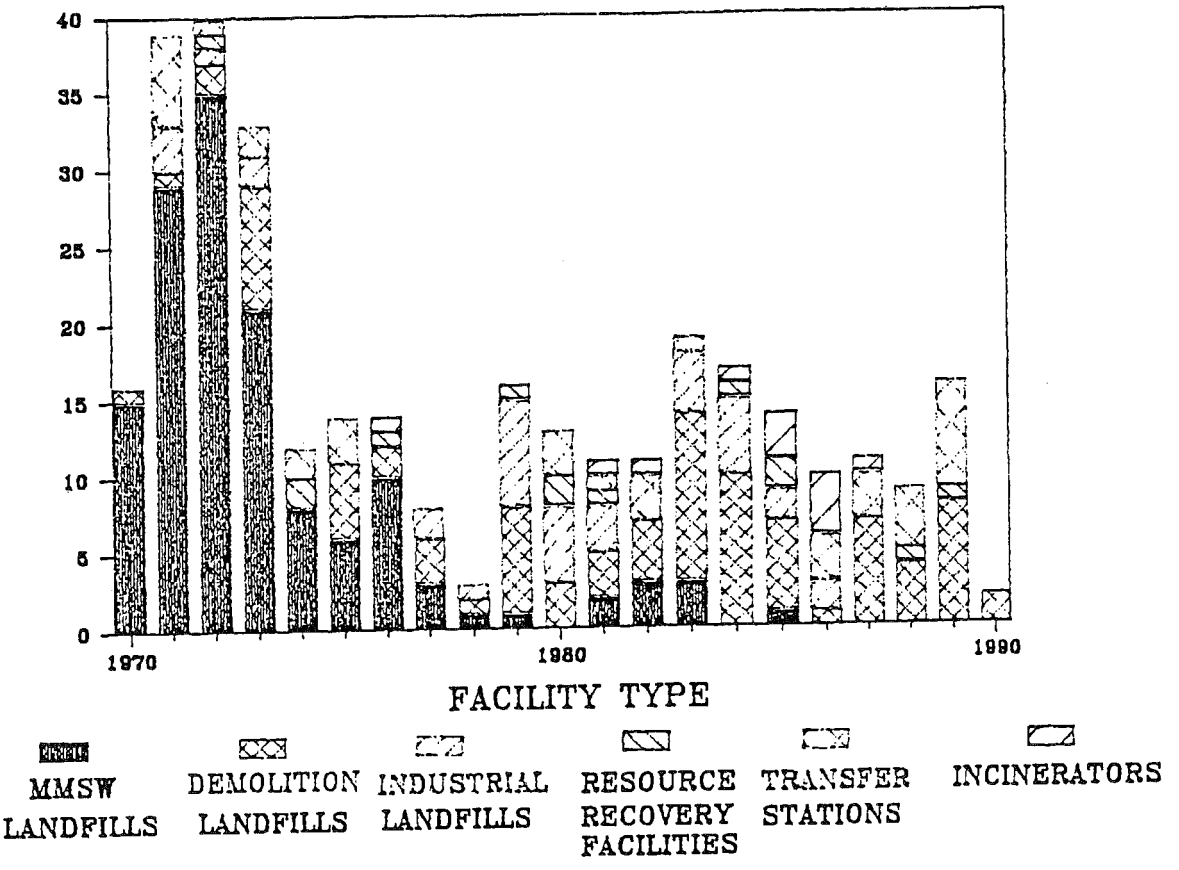
The MPCA is concerned that the state's assumption of financial responsibility for landfill long-term care will limit recycling progress. Recyclers' competitive positions could be improved if landfill fees were required to cover all long-term costs. However the state's solid waste management system shows some progress toward meeting the goals specified in the Waste Management Act, which place waste reduction and recycling ahead of land disposal. Figure 1 shows that MSW land disposal facilities handled 87.4 percent of all solid wastes in 1982. That proportion dropped to 59.2 percent in 1988. Other solid waste management methods took on greater importance, the most extensive being resource recovery/incineration (16 percent), recycling (9 percent), and demolition waste land disposal (9 percent).

The pattern of solid waste processing and disposal capacity development shows the same trend (see Figure 5).

The trends identified in figures 1 and 5 are likely to continue throughout the short-term. The solid waste management sector is a dynamic part of a changing economy. Firms and local governments that operate in this sector are now adapting to regulatory, financial and economic changes that promise to alter size distribution, location, and technological composition within the sector. Recent legislative initiatives in recycling and composting are likely to encourage facility development. Diminishing disposal capacity will likely increase cost, which will increase demand for processing facilities. However, long-term care cost subsidies (Superfund) constrain progress to the extent that land disposal fees do not reflect full cost.

FIGURE 5

FACILITY PERMITS ISSUED



E. Recommendations

The MPCA recommends legislative review of laws that relate to solid waste facility siting and permitting. This review should be directed toward developing a system that can more specifically resolve conflicts.

The MPCA recommends legislative review of the sources and uses of solid waste surcharges. This review should consider whether the varied uses of surcharges offset the shifts in waste flows that result from fee differentials.

The MPCA recommends that efforts be made to improve data quality and quantity. Survey methods can be used to accomplish much of this goal. A specific recommendation is to require complete reporting of all solid waste management facility operators who receive subsidies from state programs.

The MPCA recommends that the legislature add the ability to write solid waste violation "tickets" to the MPCA's enforcement powers. This authority would add flexibility to the MPCA's enforcement program and, ultimately, improve local solid waste management.

The MPCA directs legislative attention to growing informal reports of increased dump activity. The legislature should prepare to add state assistance to local dump control efforts.

INTRODUCTION

SOLID WASTE PROCESSING AND DISPOSAL: CAPACITY, COMPETITION, FEES AND PROGRESS

INTRODUCTION

The Minnesota Pollution Control Agency (MPCA) is now required annually to make reports to the Legislative Commission on Waste Management (LCWM) on topics about economics and planning in Minnesota's solid waste management sector. The specific charge is:

> The agency shall report to the legislative commission on waste management by July 1 of each year on the viability of the state's waste processing and disposal capability, the status of competitive forces in the market including recycling, composting, waste reduction and incineration, the extent to which existing fees for services are sufficient for facility development, engineering, environmental and safety factors, the progress of the industry in meeting the state's waste management goals, and recommendations for regulations to ensure protection of human health and the environment. In preparing the report, the agency shall consider information received under subdivision 2.
>
> Minn. Stat. § 115A.981, subd. 3.

The MPCA found in its preparation of this report that information about solid waste management is incomplete. In some cases, basic information is simply not available and alternative sources will take time to develop. In other cases, although basic information is available, it is not tested for quality. This results in analysis based on estimates and assumptions whose standards range from informed professional experience to best guess.

This report is presented as a benchmark. The LCWM receives in this report analysis of a dynamic system's current status. The solid waste management sector is now adapting to a series of legal and economic changes that have developed in recent years. When the sector finally stabilizes, it will probably look very different than it did five years ago. The reports that follow this one will address the shape and extent of change as it develops. Succeeding reports will also describe improvements in the quality of basic data and information.

The report is organized in sections that address the specific items of legislative interest. Section A considers the short-term and long-term capacities of solid waste management facilities. Section B reports on the status of competition in the solid waste management sector. Section C analyzes facility fees and their adequacy. Section D compares current solid waste management practice with the goals the legislature has set for the state. Section E presents the MPCA's recommendations for legislative action.

A. THE VIABILITY OF THE STATE'S PROCESSING AND DISPOSAL CAPABILITY

General Discussion

Nearly all mixed municipal solid waste (MSW) in Minnesota is managed by facilities that have permits issued by the MPCA. Litter and dumping remain as persistent local enforcement problems. There is now a program, funded through a sales tax on waste collection services, that provides municipalities with grants to help pay for enforcement of litter ordinances. People generally associate solid waste management capability with the capacity of permitted facilities. If a region's solid waste management facilities have approved capacities large enough to handle the region's solid wastes, then the region is considered to have a viable solid waste processing and disposal capability.

Most permitted facilities process waste. Processing facility permits limit the amount of waste to be handled within a specified period. For example, a permit for a waste burner limits burning to no more than X tons a day. The processing facility's capacity is a measure of waste flow through the facility. All other things being equal, the processing facility can handle a total amount of waste that far exceeds its flow capacity limit because the flow capacity limit applies to a fixed time period and total waste processed covers the facility's entire operating life.

The capacity of a disposal facility is a quite different measure. A disposal facility's permit limits the total amount of waste the facility can receive. The facility's capacity is fixed, decreasing throughout the term of operations. The facility can hold only Y tons of waste and no more.

The viability of capacity is also a different matter for the two different types of facilities. Viability is mostly a matter of maintenance for the processing facility. Buildings and equipment must be taken care of and replaced when they run down. The viability of a disposal facility's capacity, however, is a matter of continued new development. Every ton of waste buried decreases the facility's total capacity. The facility operator has to make and act on plans to replace the capacity lost through daily operations.

This report will consider viability as it relates to facility capacity, time, and available resources. Time influences capacity because it takes time to develop and implement solid waste management plans. Planning periods can be considered as either short-term or long-term. The difference between the two categories is the amount of time it takes to make a change in solid waste management methods. In the short-term, capacity is fixed. The short-term covers the time needed to recognize a need for change, develop plans and construct new facilities.

The long-term is more dynamic. The long-term is the time during which alternatives can be realized. Facilities can be replaced or upgraded. Markets for goods and services can be developed.

Resources are also separated into two categories. The first category consists of economic and financial resources. Safe solid waste management requires resource expenditure. Waste generators have to put wastes in an accessible, but out-of-the-way place. Collection service firms have to pick up the waste and take it to a processing or disposal facility. Facility operators have to handle

the wastes according to the requirements of their permits. Facility operators also have to maintain buildings and equipment. All of this activity has a cost. Most costs (e.g., labor, land, equipment) are easily defined in money terms. Some solid waste management costs (e.g., environmental damage) are hard to define in money terms. Although these costs are not "monetized," they still make claims on the state's total resources.

The money used to pay for solid waste management cannot be spent for other things. There is a certain amount of the state's total available resources that must be spent on solid waste management. This amount has lately been increasing in absolute terms; the rate of increase has not been as great relative to total economic output. Minnesota's solid waste processing and disposal capability could become non-viable if a) costs go so high that people refuse to use permitted facilities or, b) the state's economic and financial capacity erodes to the point that other, more basic, needs must be met before solid waste management costs are paid.

The second resource category consists of the institutional and legal arrangements that limit and direct the flow of waste. Solid waste cannot be dumped just anywhere. Dumping is a threat to human health and the environment. All levels of Minnesota government have put in place a large, and growing set of laws/rules that direct the flow of solid waste. It can only be sent to permitted facilities and these facilities can only handle the waste in specified ways and specified amounts. Some programs direct waste flows by prohibiting alternative destinations. Other programs direct waste flows by encouraging preferred destinations. There are more prohibitions than positive incentives, which contributes much to persistent litter, dumping, and permit compliance problems.

The analysis that follows considers whether current or expected resource constraints affect solid waste management so much that they threaten the state's short-term or long-term processing and disposal capability. The analysis will fill in the table below. A "yes" indicates that resources are adequate to meet the need and a "no" indicates that resources are inadequate.

ADEQUACY OF RESOURCES TO ENSURE SOLID WASTE PROCESSING AND DISPOSAL CAPABILITY

	Short-term	Long-term
Economic and financial resources		
Institutional and legal resources		

Economic and Financial Resources

Minnesota's general economy is the source of the economic and financial resources needed to operate solid waste management facilities. Solid waste management is just one of many different services provided by private and public firms. Most waste generators have to pay for waste disposal services. People generally use part of their personal income to pay for waste collection. Business firms and other institutions have to use part of their revenues to pay for waste collection.

Short-term

Solid waste processing and disposal facility operators provide most of the data needed to estimate the amount of solid waste generated in Minnesota. The data come from operating reports permittees must send to the MPCA. Data on recycling, composting, incineration, and solid waste exports must be estimated because the MPCA has not, until recently, required formal reports on solid waste handled in this manner. The reported data and estimates indicate that solid waste processing and disposal facilities handle about 16 million cubic yards of garbage (see Appendix section 1). This amounts to a little more than a ton per person.

Different facilities handle different parts of the waste stream. The solid waste processing and disposal system now has capacity to handle the existing waste stream (see Appendix section 2). Solid waste processing and disposal capability is sufficient through the short-term as well. This finding assumes that no radical change occurs in the short-term. The solid waste processing and disposal capability outlook would be different if a large incinerator or landfill were closed unexpectedly. Such actions would increase local solid waste management cost. The cost increases would result from the added transport costs incurred as wastes are hauled longer distances. The viability of local solid waste processing and disposal capability would then become a matter of whether local and/or regional economies can absorb the cost increases. Available information indicates that local and regional economies can absorb expected, and even unexpected, solid waste management cost increases.

Minnesota's economy is diverse and dynamic. The economy has lately performed well relative to neighboring states, according to the 1990 Economic Report to the Governor. For example, economic activity in Minnesota is estimated to generate a current total output of over $100 billion (see Appendix section 3). The 1990 Economic Report to the Governor cautions that the state's economy is not immune to recession. Minnesota's economic fortunes are tied to activity in

national and international markets. However, having made this cautionary statement, the 1990 Economic Report also notes that Minnesota's recovery rate after recession is relatively fast. Growth rates during expansionary periods are also relatively good.

The short-term prospects for Minnesota's general economy are good. This is an indirect sign that the state's solid waste processing and disposal capability is viable, in the short-term. Solid waste processing and disposal capability could be jeopardized if Minnesota's economy were in decline. During a recession, demand for goods and services declines generally. A drop in demand for solid waste management services would cause marginal firms to quit doing business. The wastes handled by firms quitting would have to be managed by other firms, which may not have resources adaptable enough to take care of short-term demand surges.

Another measure of solid waste processing and disposal capability compares solid waste processing and disposal costs with the state's total economic and financial resources. Appendix sections 1 and 4 have estimates of solid wastes managed and of direct solid waste management costs, which are summarized below:

Solid wastes managed by permitted facilities or exported to other states in 1988	16.6 million cubic yards
Estimated direct costs of solid waste management (stated in millions of dollars at 1989 average rates)	$693 to $1,040
Estimated costs per capita	$161 to $241
Total solid waste management costs as a percent of estimated 1988 gross state product	0.74 to 1.11

Comparing the financial costs of solid waste management to the state's economic resources indicates that resources, in the short-term, are probably sufficient to meet needs.

Long-term

Long-term prospects for the state and its solid waste management sector are less clear. The forecasts presented in the Appendix show steady growth in output and employment. The forecasts make no allowance for the possible effects of a recession.

The prospect for solid waste management costs is clearer. These costs are likely to increase through the short-term and into the long-term. A number of factors will contribute to increasing costs.

1. Diversification of solid waste processing and disposal systems. The solid waste management sector is in a period of change. Large-scale solid waste processing and disposal systems (e.g., incinerators, landfills) are being developed to serve regional markets. Specialized small-scale systems are being developed to serve local markets.

Previously, a typical solid waste management system for a four-county region consisted of three to five landfills and a few waste collection services. Systems like this are now developing a more diversified look. Usually, the updated solid waste management system has only one, or maybe two, landfills of advanced design. Often, such a system will also feature a large-scale processing facility (e.g., incinerator, MSW compost system). The system will also develop a recycling network, with decentralized collection points and central or sub-regional processing facilities. Another typical feature is a network of local yard waste composting facilities. This solid waste management system's operations require increased planning, handling, and facility care. It also requires more money. Regional solid waste management systems are now in various stages of diversification. Solid waste management costs are likely to increase as more regional systems diversify.

2. Increasing long-term care costs. Most current landfill facilities are old ones that were not built or operated according to sound environmental standards. These landfills are likely to cause environmental damage that extends beyond the short-term. Environmental problems have already been identified at a number of landfills. Some have begun to take corrective action that is aimed at cleaning up contamination.

   Most landfill permittees have yet to incur the largest part of expected corrective action costs. As the bills for long-term care come due over the next five to ten years, solid waste management costs will rise.

3. Declining market value of recycled materials. Recent legislative initiatives are expected to increase the supply of recycled materials. Prices for recycled materials will drop as supply increases, all other things being equal. Government procurement programs may boost the derived demand for recycled goods, but probably not enough to offset the price effect of the expected supply increase. Falling prices will lower recyclers' revenues. This will lead to either increased collection subsidies for recyclers or dead weight losses as some recyclers fail and supplies fall. In either case, total solid waste management costs will rise.

4. Increasing costs of permit maintenance. Recent developments in solid waste regulation indicate that the fixed costs incurred to secure or maintain a permit will increase steadily in the future. Facility permits of all sorts are being held up in legal and administrative actions that inhibit local solid waste management capabilities. The concerns raised deal with environmental damage and loss of property value. The issues are not easily or quickly resolved. Administrative hearings and court actions can cost millions of dollars. Most facility permits now have approved capacities that are sufficient to get through the short-term. However, nearly all facilities will incur higher legal and administrative costs in the long-term as permits are modified.

5. Market centralization. A variety of forces (e.g., increasing legal, administrative, and regulatory costs) now influence development toward market centralization of solid waste processing and disposal systems. Many of the new costs are fixed, which means that economies of scale will lead to larger facilities with regional, rather than local, markets. Rates will rise as market centralization progresses because waste generators will have fewer alternative disposal locations. The increase may not be dramatic

throughout all service areas, since there will nearly always be some competition at market boundaries. Facility operators' abilities to set different prices for different customers will determine the extent of price increases.

6. Public sector support. Nearly all elements in current solid waste processing and disposal systems enjoy some form of government subsidy. Appendix section 5 has an estimate of the extent of indirect government spending on solid waste processing and disposal.

   Government subsidies for solid waste processing and disposal systems take many forms. State programs offer capital and research grants for development of systems that provide alternatives to land disposal. The metropolitan region offers unit-based subsidies to local governments' recycling programs. Recent comprehensive recycling legislation will likely extend recycling subsidies throughout the state.

   Subsidies interfere with the price signals that buyers and sellers in competitive markets rely on to make decisions. Subsidized prices distort market operations. The distortions of solid waste processing and disposal prices are likely to be rather severe because the markets used are underdeveloped. Established markets have open and well-known transportation and communication networks. Buyers and sellers have ready access to supply and output prices. Solid waste markets are often controlled at critical points by brokers who hoard information. Local monopolies abound; some are created by public policy.

   Government regulations further distort solid waste market systems. Solid waste processing and disposal systems have only recently begun to pay for the costs of environmental damage caused by earlier facility operations. The environmental harm caused by unsafe solid waste processing and disposal systems has led state and local governments to impose rather extensive regulations on solid waste management firms. The regulations tend to limit management choices, which usually means higher cost.

   The market distorting effects of subsidies and regulations will influence long-term solid waste processing and disposal costs. However, the direction and extent of these effects is unknown.

The state's economic resources are probably sufficient to ensure the long-term viability of solid waste processing and disposal capacity. Solid waste management costs are likely to increase in the long-term, but the state's long-term economic growth prospects are fairly good. Solid waste management costs are unlikely ever to rise to the point that they comprise a large fraction of the state's economic and financial resources.

However, there will likely be some losses of marginal firms in the event of recession. Two factors may minimize these losses. First, the strong public support for safe solid waste management will likely help some marginal firms to ride out a recession. Subsidies, grants, and public/private cooperative arrangements will provide financial support if operating revenues fall off. This support will probably not be enough for all marginal firms, but it should help some.

The second factor helping the solid waste management sector through a recession will likely be the strong demand for solid waste management services.

Investigation generally finds that the demand for solid waste management services is fairly strong and not very responsive to changes in price. This means that the expected solid waste management cost increases will not greatly lower demand for solid waste management services. However, investigation has also shown that solid waste management service demand is responsive to income. This means that a recession would cause some decrease in the demand for solid waste management services if personal incomes are reduced. The net result will depend on which response is stronger, the price effect or the income effect.

In sum, Minnesota's long-term economy is probably strong enough to maintain solid waste processing and disposal capacity through all but the worst of recessions.

ADEQUACY OF RESOURCES TO ENSURE SOLID WASTE PROCESSING AND DISPOSAL CAPABILITY

	Short-term	Long-term
Economic and financial resources	YES	YES, but somewhat sensitive to recession
Institutional and legal resources		

Institutional and Legal Resources

Everyone has an interest in solid waste management. Waste generators want to be assured of timely and efficient service by waste collection firms. Waste collection firms want ready access to customers and waste processing or disposal facilities. The operators of solid waste processing and disposal facilities want to have enough waste taken in so that they can meet expenses and, for private firms, earn a target rate of profit. State and local governments want to make sure that all solid waste management meets environmental safety standards. No one wants to waste money, so it is safe to assume that everyone wants solid waste management goals to be met at least cost.

This simple statement presents an inadequate picture of the solid waste management system's maze of interlocking, interdependent, and sometimes conflicting authorities and responsibilities. Appendix section 6 presents a picture of the public sector's involvement in solid waste management. Private sector firms are also involved throughout the system as facility operators, waste haulers, and technical consultants.

Although safe waste disposal is the basic goal of all firms operating in the sector, problems arise because important secondary goals often conflict. Consider, for example, conditions in which a private facility operator must meet environmental standards and must also ask a local government for rate increases. The private operator wants to make profit, but realizes that raising rates may lower revenues and profits. The government enforcing environmental standards wants safe waste disposal, but realizes that excessive regulation may cause the private operator to give up the business. The local government wants timely and safe disposal, but also wants to minimize service costs.

Minnesota state and local governments have confronted these problems by requiring increasingly extensive planning and reporting on solid waste management. Policy-makers intend that better information will lead to better decisions. Another method used to solve solid waste management problems is to subsidize preferred solid waste management methods. Appendix section 5 presents a description of the various public subsidy programs and an estimate of their costs.

The extent of public involvement in solid waste management carries with it a responsibility to see that public resources are not wasted. This implies administrative oversight and regulation of solid waste management activities and reports. The goal of this regulatory effort is to make sure that solid waste management facilities meet defined standards.

Administrative regulations are generally thought of as direct constraints on facility design and operations. However, there are also indirect constraints that result from procedural rules. The MPCA and local governments are required to provide open public access in permitting and licensing actions. Public notice is required for any substantial action in which a solid waste management facility or plan is involved. Individuals or groups can compel independent administrative hearings if they can prove that the issues they raise are substantial. If challengers fail to get an administrative remedy, they can still take action through courts.

Administrative and legal challenges have lately become routine when solid waste management facility siting and operations are at issue. Challenges generally seek facility closure. Successful challenges can have drastic effects on local and regional solid waste processing and disposal capabilities. The challenges that have been made lately have substantially raised the stakes in solid waste management. The MPCA, local governments, and facility permittees must be prepared to bear substantial costs when taking actions that change local and regional solid waste management systems. For example, a permittee's request to expand a Twin Cities landfill is now entering its eighth year. The action, now subject to an administrative contested case hearing, has cost millions of dollars for the MPCA, the challengers, and the permittee. The MPCA expects that this matter will not be resolved administratively. Whether the expansion request is granted or denied, the matter will be subject to court proceedings. This means that final resolution will likely cost a few more million dollars.

Short-term

The difference between short-term and long-term is rather fluid when institutional and legal resources are considered. Laws and ordinances can be changed rather quickly. The Waste Management Act has been amended each year since its enactment in 1980. Controversial matters usually cannot be handled in just a year. More often, a year or two of study is required before legislative action is taken. Changes in administrative programs generally take longer than legislative change. Most rule amendments require four or five years' time. MPCA administrative policies can be changed rather quickly, but if implementation requires added staff time, three years or more are needed in order to develop the new program.

Although most institutional and legal resources are fixed in the short-term, a recent legislative change is likely to have direct positive effects on solid waste processing and disposal capabilities. This is the recycling law that was

enacted in 1989. This law is intended to put in place strong recycling incentives throughout the state. If this program meets its goals, solid waste processing and disposal capabilities will be increased. The 1994 goal is to recycle 35 percent of the metropolitan region's solid waste and 25 percent of all solid wastes outside the metro region.

There are few other prospects for short-term expansion of solid waste processing and disposal capabilities. A number of facility permits are now in development. None of these facilities are expected to begin operations within the next four or five years. This means that Minnesota's total solid waste processing and disposal capability is likely to diminish throughout the short-term. Success in local recycling programs will slow the rate of decrease.

Short-term institutional and legal resources are now adequate to meet solid waste management needs, but these resources will be in decline throughout the period. Some facilities will close during the short-term. Facility closure will not necessarily lead to local solid waste management crises because, in all cases, alternate solid waste processing and disposal facilities are available.

Long-term

The prospects for the long-term are not as good. Permits for solid waste processing and disposal facilities are limited to five years. Current conditions indicate that it will take more than five years for most facilities, new or expanded, to get permits. This means that facility operators will have to devote more resources to the administrative and legal procedures required for permit approval or renewal. The MPCA expects that some permittees will not want to do all this work. Remaining facilities will have to be larger in order to handle the solid waste previously sent to smaller facilities. All other things being equal, larger facilities require more time to get permits, which will further diminish long-term solid waste processing and disposal capability.

There is no way to be certain now whether institutional and legal resources are adequate to ensure long-term solid waste processing and disposal capability. There is some reason to expect that current institutional and legal resources will not be equal to the task. This is because there is no indication that current short-term constraints are likely to change.

ADEQUACY OF RESOURCES TO ENSURE SOLID WASTE PROCESSING AND DISPOSAL CAPABILITY

	Short-term	Long-term
Economic and financial resources	YES	YES, but somewhat sensitive to recession
Institutional and legal resources	YES, but diminishing	PERHAPS; there is cause for concern

B. THE STATUS OF COMPETITIVE FORCES IN THE MARKET INCLUDING RECYCLING, COMPOSTING, WASTE REDUCTION AND INCINERATION

A basic indicator of competition in an economic sector is the number of firms that operate within that sector. Competitive markets have many firms that provide identical goods or services. Markets become less competitive as goods and services differentiate and as the number of firms declines. Monopoly occupies the other end of the market organization spectrum. In monopolistic markets, a single buyer or seller controls activity so completely that the monopolist can compel individual customers to accept unique prices.

Operating reports from permitted solid waste management facilities indicated the following numbers of firms active within MPCA's six regions in 1988.

FACILITY TYPE	MPCA REGION					
	METRO	DULUTH	BRAINERD	DETROIT LAKES	MARSHALL	ROCHESTER
MSW landfill	10	21	16	11	17	13
Resource recovery	3	1	0	3	0	0
Industrial solid waste landfill	10	4	0	5	0	4
Demolition waste landfill	4	3	8	6	1	4
MSW incinerator	1	1	0	4	0	4
	28	30	24	29	18	30

A number of changes to regional systems have occurred since the 1988 operating reports were compiled. A number of MSW landfills have or will soon shut down. There will probably be about 55 to 60 MSW landfills operating by the end of this summer. Two large-scale MSW burners have begun operations: Hennepin Energy Resource Company and Elk River. Three MSW compost facilities have begun operations and there are plans to develop six more such facilities. The MPCA has only recently begun collecting data on recycling and yard waste composting facilities, following adoption of rules that require recyclers to notify the MPCA of their locations and operating status. As of March of this year, 41 recycling facility operators have sent correct notifications to the MPCA. Fifteen of these recyclers are located in the seven-county metropolitan region. Recent restrictions on yard waste disposal have caused an increase in yard waste composting activity. As of March of this year, the MPCA has received notifications from 40 operators of yard waste compost facilities.

Competition is more than just a matter of counting the number of firms that operate within a chosen sector. The concern policy makers have with competition goes beyond an interest in general economic development. Competition is considered a necessary condition for economic efficiency. The basic assumption is that the lowest prices result when many buyers and sellers trade in free markets. Competitors have to accept market prices that are set by general market activity that is beyond the control of any individual or group. If a market has only a few buyers or sellers, the result is often assumed to be inefficient.

The market that has only a few buyers or sellers is called a "concentrated" market. Large firms in concentrated markets are considered to have some control over prices. The concern of policy makers is that market power will be used to gain profits greater than the profits that would result if there was more competition.

The following table presents measures of regional market concentration in the solid waste management sector. Each facility is presented along with its 1988 reported amount of waste received and its share of the total regional waste stream. A column of cumulative shares is added as a measure of concentration. So, in 1988, the Pine Bend and the Burnsville landfills handled respectively 50.5 percent and 19.5 percent of the waste landfilled in the metropolitan region. The two landfills combined to account for 70 percent of landfilled waste.

FACILITY SHARES OF WASTE RECEIPTS
by MPCA Region

Facility	Waste Received 1988	% of Total	Cumulative %
METRO REGION			
Pine Bend SLF	2,837,903	50.54%	50.54%
Burnsville SLF	1,092,064	19.45%	69.98%
Louisville SLF	664,351	11.83%	81.81%
Woodlake SLF	471,028	8.39%	90.20%
Anoka Municipal SLF	261,499	4.66%	94.86%
East Bethel SLF	185,689	3.31%	98.17%
Freeway SLF	87,025	1.55%	99.71%
Dakhue SLF	7,467	0.13%	99.85%
Flying Cloud SLF	6,908	0.12%	99.97%
Waste Disposal Eng.SLF	1,634	0.03%	100.00%
MSW landfill total	5,615,568		
Dem-Con	642,074	52.72%	52.72%
Crosby American	312,144	25.63%	78.35%
Dawnway Demo	260,812	21.42%	99.77%
Frattalone	2,818	0.23%	100.00%
Demolition total	1,217,848		
ROCHESTER REGION			
Ponderosa SLF	177,374	17.46%	17.46%
Albert Lea SLF	144,130	14.18%	31.64%
Rice Co. SLF	135,396	13.32%	44.96%
Tellijohn SLF	112,389	11.06%	56.02%
Winona SLF	112,269	11.05%	67.07%
Steele Co. SLF	92,841	9.14%	76.21%
Faribault Co. SLF	64,690	6.37%	82.57%
Watonwan Co. SLF	48,860	4.81%	87.38%
Waseca Co. SLF	44,921	4.42%	91.80%
Brown Co. SLF	42,477	4.18%	95.98%
Wabasha Co. SLF	18,290	1.80%	97.78%
Dodge Co. SLF	13,302	1.31%	99.09%
Red Wing SLF	7,977	0.79%	99.88%
Sun Prairie (Reak) SLF	1,248	0.12%	100.00%
MSW landfill total	1,016,165		

FACILITY SHARES OF WASTE RECEIPTS
by MPCA Region

Facility	Waste Received 1988	% of Total	Cumulative %
DULUTH REGION			
Hibbing SLF	105,814	17.25%	17.25%
East Mesaba SLF	92,500	15.08%	32.33%
WLSSD SW Processing	79,943	13.03%	45.36%
Grand Rapids SLF	75,306	12.28%	57.64%
Lake Co. SLF	51,803	8.44%	66.08%
WLSSD SLF	40,872	6.66%	72.74%
Koochiching SLF	34,789	5.67%	78.42%
Hudson SLF	22,792	3.72%	82.13%
Northwoods SLF	21,847	3.56%	85.69%
Aitkin Area SLF	21,125	3.44%	89.14%
South Carlton SLF	10,031	1.64%	90.77%
Hickory Grove SLF	9,801	1.60%	92.37%
Cook Area Mod. LF	9,800	1.60%	93.97%
Cotton Area Mod. LF	7,622	1.24%	95.21%
Vermillion Mod. LF	6,467	1.05%	96.26%
Cook Co. SLF	5,337	0.87%	97.13%
Brookston Area Mod. LF	4,163	0.68%	97.81%
Hwy. 77 Seasonal SLF	3,710	0.60%	98.42%
City of Hoyt Lakes SLF	3,267	0.53%	98.95%
Northome Mod. LF	3,053	0.50%	99.45%
Carlton Co. SLF #2	1,793	0.29%	99.74%
Portage Mod. LF	1,594	0.26%	100.00%
MSW total	613,429		
BRAINERD REGION			
Elk River SLF	552,012	32.97%	32.97%
Paynesville SLF	539,232	32.21%	65.17%
Yonak SLF	206,141	12.31%	77.49%
Crow Wing SLF	108,533	6.48%	83.97%
Pine Lane SLF	56,495	3.37%	87.34%
Korf Bros. SLF	47,620	2.84%	90.19%
Lindala SLF	41,690	2.49%	92.68%
Kanabec SLF	35,594	2.13%	94.80%
Long Prairie SLF	34,357	2.05%	96.85%
Bueckers SLF	15,353	0.92%	97.77%
Lindenfelser SLF	11,394	0.68%	98.45%
French Lake SLF	10,791	0.64%	99.10%
Cass Co. Walker-Hackensack SLF	7,474	0.45%	99.54%
Cass/Remer SLF	3,152	0.19%	99.73%
Sauk Centre SLF	2,969	0.18%	99.91%
Fifty Lakes Mod. LF	1,543	0.09%	100.00%
MSW total	1,674,350		

FACILITY SHARES OF WASTE RECEIPTS
by MPCA Region

Facility	Waste Received 1988	% of Total	Cumulative %
DETROIT LAKES REGION			
Polk Co. SLF	111,562	24.27%	24.27%
Clay Co. SLF	97,586	21.23%	45.51%
Becker Co. SLF	90,152	19.62%	65.12%
Salol SLF	44,214	9.62%	74.74%
NE Otter Tail SLF	27,409	5.96%	80.71%
Pennington Co. DRDF	25,174	5.48%	86.19%
Fergus Falls SLF	22,802	4.96%	91.15%
Kluver SLF	14,309	3.11%	94.26%
Lake of the Woods SLF	10,278	2.24%	96.50%
St. Cloud Transfer & Recycl.	7,233	1.57%	98.07%
Anderson Kittson Co. SLF	6,233	1.36%	99.43%
Stevens Co. SLF	2,430	0.53%	99.96%
NSP Elk R. RDF	155	0.03%	99.99%
Northwest Angle Mod. LF	51	0.01%	100.00%
MSW total	459,588		
MARSHALL REGION			
McLeod Co. SLF	178,910	31.12%	31.12%
Kandiyohi Co. SLF	61,394	10.68%	41.80%
Lyons SLF	57,991	10.09%	51.89%
Nobles Co. SLF	44,821	7.80%	59.69%
Pipestone SLF	44,359	7.72%	67.40%
Tostenson Gabrielson SLF	35,058	6.10%	73.50%
Rock Co. SLF	24,723	4.30%	77.80%
Renville Co. SLF	24,649	4.29%	82.09%
Redwood Co. SLF	23,127	4.02%	86.11%
Cottonwood SLF	19,334	3.36%	89.48%
Murray Co. SLF	12,987	2.26%	91.74%
City of Benson SLF	12,837	2.23%	93.97%
Jackson Co. SLF	10,096	1.76%	95.73%
Big Stone Co. SLF	8,432	1.47%	97.19%
Lenzen SLF	8,181	1.42%	98.62%
Meeker Co. SLF	7,929	1.38%	99.99%
Lincoln Co. SLF	30	0.01%	100.00%
MSW total	574,858		

The distribution of waste among facilities is a useful starting point in considering the status of competition in the sector. However, this simple presentation does not take into account important details of regional organization and recent developments.

The pattern of facility ownership influences the status of competition also. The metropolitan region and the counties surrounding it have nearly all privately owned and operated landfills. This expanded metropolitan region has only a few publicly owned and operated landfills. The region does have a number of solid waste processing facilities that operate under various ownership arrangements. Two of these are private facilities, which began operations in 1987: the Ramsey County/Washington County RDF facility in Newport and the Reuter's Recycling facility in Eden Prairie. Private ownership of these facilities does not necessarily make them competitive. Both facilities operate with waste assurance arrangements provided by local governments. So, although the facilities are privately owned, they do not compete with each other.

Other facilities have begun operation since 1988. The Hennepin County energy recovery facility in Minneapolis handled about 180,000 cubic yards of solid waste in 1989 and the United Power Association RDF plant in Elk River handled about 375,000 cubic yards in 1989. These are both privately operated facilities. Still more solid waste processing facilities are scheduled to begin operations in the next few years. Dakota County has plans to build an incinerator and; Scott, Carver, and Wright counties have plans to build MSW composting facilities. These will be publicly operated facilities.

The local governments in the metropolitan region have nearly all enacted waste control measures that direct waste to designated facilities. The designated facilities do not compete with each other because their waste streams and revenues are assured. The competitors in the region are the private facility operators who bid for residual wastes but do not have waste flows assured, private waste collection firms and private recyclers. Narrative reports indicate that competitive pressures are increasing among recyclers, particularly for the higher valued materials such as aluminum cans. Competition is reported to be less intense for lower-valued materials such as newsprint.

Outside the expanded metropolitan region, private facility ownership and operation is much less common. Most waste haulers and many recyclers are private firms. There is little reported competition among public facilities. The one factor that leads to some competition is the processing facility operator's interest in operating near or at the plant's design capacity. Operations at this level are more efficient and, thus, cheaper on a unit basis. There are reports of some facility operators that actively seek more waste, but they do not compete with respect to price. Instead, such operators will sometimes offer concessions in waste assurance terms. There are also reports of differential pricing by facility operators. In cases of this sort, facility operators use market position to control price, by compelling waste generators to accept terms that would be unacceptable in more open markets.

The continued concentration of centralized processing and disposal facilities is an element that discourages competition. A number of forces encourage the concentration of solid waste processing and disposal markets. Large-scale processing facilities cannot be financed unless they are supported by effective waste assurance arrangements. The waste flow controls that are needed effectively eliminate competition within the central facility's service area.

Recent changes in environmental regulations favor large-scale facilities. The costs of compliance are nearly scale-neutral; they do not increase much as the size of the facility increases. This means that the costs of compliance are nearly fixed. The large-scale facility can spread fixed costs over a wider service area, which means unit rates will be relatively low, giving the large-scale facility a competitive advantage over the small-scale facility. These two factors - waste flow controls and regulatory costs - combine to erect substantial barriers to the entry of new competitors in the solid waste management sector.

Since new entrants in the solid waste management sector are unlikely, competition is left to existing firms. If these are private firms, they do compete in regions where their service areas overlap. Distance and service charges determine the extent of overlap. Distance matters because the waste generator's garbage disposal bill actually has two components (see Appendix section 4B). The collection and transport part of the bill is generally three to four times greater than the disposal part of the bill. This difference occurs because collection and transport are relatively time-consuming, labor-intensive activities. When competition between facilities is allowed, waste haulers have to pay attention to both facility charge rates and the distance between facilities. Conditions will arise in which waste haulers will use higher cost disposal facilities because any savings available at an alternative facility are offset by the added transport costs. Competition of this sort is limited to those regions in which private facility operators have neighboring or overlapping service areas. Such conditions are found in only a few regions.

Competition among different types of solid waste management facilities is reported to be more common than competition among the same types of facilities. The recent changes in solid waste facility rules have compelled landfill operators to recognize the long-term liabilities implicit in land disposal of waste. As landfill rates have increased to cover these liabilities, some operators report losing customers to alternative facilities that do not have such extensive liabilities associated with their operations. Changes of this sort do not result from trade competition. Rather, it is the leveling of cost differentials that leads customers to switch from one facility to another.

Given the extent of regulation and the forces favoring large scale, the private waste collection and hauling firms probably comprise the most competitive group in the solid waste management sector. They are certainly the largest group. An LCWM report developed last year estimated that there are about five hundred independent waste hauling firms in the state. The Department of Revenue has begun gathering data on waste collection firms, through collection of the new sales tax on waste collection services. Revenue Department information shows that the new tax added about 1,000 new firms to the tax rolls. Department of Revenue analysts estimate that waste collection firms account for about 800 to 850 of the new taxpaying firms.

When haulers are not bound by waste flow controls, they can use their choice of disposal facility to control cost and either add the savings directly to profit or pass most of the savings on to their customers in the hope of increasing total sales. Narrative reports on waste collection and hauling firms are mixed. The MPCA receives occasional narrative reports that waste haulers impose excessive rate increases whenever processing or disposal facility rates change.

These reports generally come from outside the metropolitan region, in areas served by a single firm. The MPCA also receives narrative reports that competition among haulers is fierce in some cities. None of these reports have been investigated in detail.

C. CURRENT FEES AND COSTS

The prices of goods and services do not always equal production costs. This is the root cause of many environmental problems. The environment is not a thing that any one person owns. There is no one to submit a bill for damages when pollution occurs. Economic activities (production, consumption, investment) can have unintended environmental effects because economic agents (producers, consumers, investors) rely on prices when making decisions. If the prices of goods and services do not include environmental damage costs, pollution problems will result because waste disposal is available as a free service.

The costs of concern for this report are labeled generally as 1) facility development and engineering and 2) environmental and safety factors. These general costs relate directly to the effects that facility operations will have on environmental quality. A solid waste facility manager's financial plans must take these costs into account in order to minimize environmental impacts. The separate elements in facility development and design include planning, design, siting, and construction. The separate elements in environmental and safety factors include facility operations that meet prudent care standards, regular maintenance, and contingency planning.

Solid waste management facility fees have been increasing in recent years. The MPCA in 1988 promulgated rules that had direct impacts on facility costs. The Statement of Need and Reasonableness for that rulemaking included estimates of the financial impacts the rules would have on facilities (See Appendix section 7). The MPCA in 1988 had informal reports of facility fees ranging from $1.50 per cubic yard to $10.00 per cubic yard. The MPCA estimated that, depending on site-specific conditions, fees charged after rule promulgation could range between $11.80 per cubic yard to $43.20 per cubic yard.

Submissions of facility operating reports are now only a little more than half complete. In the reports submitted, 1989 landfill rates range from $3.00 per cubic yard to $20.00 per cubic yard. The average of reported landfill rates is about $11.50 per cubic yard. The average of resource recovery facility rates is about $18.00 per cubic yard, with a range of $13.80 to $28.50. These averages are strongly influenced by conditions in the metropolitan region because all metropolitan region facility operators have submitted annual reports. A number of non-metropolitan facility operators have not submitted reports.

The reported increase in rates indicates that solid waste management prices are beginning to include the costs of environmental care since the rate increase schedule coincides with the implementation of the solid waste rules. However, further examination shows that some costs are not included in any fees and that some fees do not reflect all costs.

The costs not included in any fees are described as indirect costs in Appendix section 5. These are the costs incurred to subsidize preferred solid waste management operations, such as recycling and, to pay for corrective action at

landfill sites through Superfund. The money needed to fund these programs does not come from solid waste management facility fees. Cost for these programs falls not on facility users but on taxpayers generally, solid waste generators and hazardous waste generators.

The majority of large-scale solid waste management facilities charge direct service fees. Facility users pay rates that are based on the amount of waste they drop off for processing or disposal. However, there are facilities whose rates do not cover all costs. These facilities get revenues from a combination of tipping fees and property-based user fees. Systems like this are developed for publicly-owned facilities because local officials want to make sure that waste generators use the facilities. They reason that waste generators can avoid tipping fees by dumping. However, waste generators cannot avoid a user fee that accompanies property tax statements. Local officials believe waste generators will try to maximize their use of services for which they have already paid.

Other mixed-financing systems have developed for quite different reasons. Early local government management of permitted facilities considered facility operations as services of public works departments. Although many such facilities charged tipping fees, the fees were often kept rather low in order to encourage facility use and to minimize service charges to facility users. The landfill operations "borrowed" personnel and equipment from other departments. Fees did not cover all operating costs. Narrative reports from permittees indicate that the practice of lending resources from other departments to landfill enterprises is dying out.

Many facility permittees during the early years of operations ignored the costs of long-term care. Facility users were not charged to pay for facility closure, postclosure care or corrective action. The 1988 solid waste facility rules require permittees to prepare for the costs of long-term care. So the costs of environmental safety measures are now being built into many facility fees. It is still too soon to tell how accurate the extra fees will be.

Some public facilities make no direct charges for service. Facility operating costs are met through appropriations from permittees' general budgets. Local officials in charge of these facilities want to minimize the costs of public services. There are not many such systems left and a few are reported to have switched from tax-based to fee-based financial management.

On a statewide basis, current fees are not sufficient to cover environmental safety and system operating costs. The extent to which fees cover costs varies among regions. The solid waste management facilities in the metropolitan region and its surrounding area are nearly all privately owned and operated. Private sector operators' revenues come only from tipping fees. These fees are beginning to include intermediate design costs (e.g., installation costs for ground water monitoring systems). The average of rates reported by private landfill operators is nearly $12 per cubic yard. These rates do not reflect all potential development costs because all the facilities have operated for a number of years. Few of the landfill operators have incurred costs for planning, siting, and constructing a new facility. The new waste incinerators provide some indication of the difference new development costs can make. The weighted average of rates reported by incinerator operators is nearly $18 per cubic yard.

Rates reported by non-metropolitan operators are lower; about $8.50 per cubic yard. The non-metropolitan operators are nearly all local governments. Two regional differences account for most of the difference in rates. First, quite a few of the non-metropolitan landfills will close this year. They are closing to avoid compliance with the financial assurance rules that were promulgated in 1988. The rates reported for facilities soon to close do not include complete charges for long-term care. Second, some of the non-metropolitan facilities use the mixed revenue financial systems described above. The fees charged by these facilities do not cover full costs.

Finally, none of the fees reported include charges for some of the indirect costs described in Appendix section 5. The indirect costs are covered by statewide programs that get revenue from statewide taxes and fees (e.g., Superfund, Capital Assistance Program).

Long-term care costs for MSW land disposal facilities are matters of particular concern because the resources involved are substantial. The difference is not a matter of urgent short-term concern because action at most of the landfill sites that are on the state Superfund list will be spread out throughout the short-term.

The problem is likely to get worse in the long-run. The environmental damage leaking landfills cause does not go away naturally. Direct action is required to manage these problems. There are now 56 landfills on the state Superfund list. More landfills will be added to the list as water quality tests are completed.

D. PROGRESS IN STATE WASTE MANAGEMENT GOALS

The MPCA is concerned about future progress toward meeting statewide solid waste management goals. Section C identified a set of indirect subsidies that apply to solid waste management costs. The MPCA is concerned that the state's assumption of financial responsibility for landfill long-term care will limit recycling progress. Recyclers' competitive positions could be improved if landfill fees were required to cover all long-term costs.

Minnesota's waste management goals are set by law:

> 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. The following waste management practices are in order of preference:
>
> 1. waste reduction and reuse;
>
> 2. waste recycling and yard waste composting;
>
> 3. resource recovery through mixed municipal solid waste composting or incineration; and
>
> 4. land disposal.

Minn. Stat. § 115.02.

The pattern of facility development is one indication of progress toward meeting the state's waste management goals. The first solid waste management facility permits were issued in the early 1970s. Nearly all of these permits were issued for land disposal facilities. Recent years have seen a marked change in this pattern.

PERMITS ISSUED FOR SOLID WASTE MANAGEMENT FACILITIES

YEAR	Ash Disposal	MSW Incinerator	Demo LF	Industrial LF	MSW LF	Resource Recovery	Transfer Station	Total
1970			1		15			16
1971			1	3	29		6	39
1972			2	1	35	1	1	40
1973			8	2	21		2	33
1974					8	2	2	12
1975			5		6		3	14
1976		1	2		10	1		14
1977			3	2	3			8
1978			1	1	1			3
1979			7	7	1	1		16
1980			3	5		2	3	13
1981		1	3	3	2	1	1	11
1982		1	4		3		3	11
1983			11	4	3		1	19
1984		1	10	5		1		17
1985		3	6	2	1	2		14
1986	2	4	1	2			3	12
1987	1	1	7				3	12
1988			4			1	4	9
1989	1		8			1	7	17
1990			2					2
Total	4	12	89	37	138	13	39	332

The trend in facility development is away from MSW land disposal and in the direction set by the state's solid waste management goals. The MPCA has only recently required that recycling and yard waste compost facilities have permits. These facilities are now considered to have permits without submitting formal permit applications to the MPCA as long as they meet a set of established criteria. Facility operators are required instead to meet specified location, design and operational standards. Facility operators must also report to the MPCA on locations and amounts of waste handled. The reports are just now coming in. As was expected, a number of new yard waste compost facilities are starting to operate, particularly in the metropolitan region. The MPCA expects that more such facilities will be developed as the ban on yard waste incineration and disposal is extended outside the metropolitan region.

Recycling activity is also expected to increase with the help of additional state support beginning this year. The Metropolitan Council reports that in 1988, within the metropolitan region, about 12 percent of the waste stream was

recycled under source separation programs. The Council also estimates that about 15 percent of the waste stream was recycled under undocumented programs. The total 1988 recycling estimate for the region is 27 percent or about 700,000 tons.

Although some non-metropolitan recycling programs have operated for a few years now, recycling progress outside the metropolitan region is not reported to be as advanced. Appendix section 1 takes this into account in its estimates of the amount of solid waste accounted for by solid waste management facilities and exports to other states. The statewide recycling estimate is 12 percent of the total reported by permitted MSW disposal facilities. This estimate accepts the Metropolitan Council's 27 percent recycling estimate and adds five percent for the rest of the state.

E. RECOMMENDATIONS FOR REGULATIONS TO ENSURE PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

The 1990 legislature limited the scope of recommendations to be made in this report. Any regulations proposed are to be designed "to ensure protection of human health and the environment." The matters considered in this report all focus on the financial or administrative aspects of solid waste management. They might seem at first glance to have little connection to human health and the environment.

Financial and administrative resources are considered in this report as necessary conditions for safe solid waste management. Adequate financing and careful administration are not the only things needed to ensure safe waste disposal, but without money and administrative control, threats to human health and the environment will result.

Solid Waste Processing and Disposal Capacity

The apparent long-run capacity constraint is a matter that deserves careful legislative consideration. Regardless of progress in solid waste management goals, land disposal capacity represents a binding limit on system-wide capacity. Solid waste processing can ease, but not eliminate, this constraint.

Capacity limits vary among regions. New solid waste processing and disposal capacity is becoming extremely hard (e.g., costly) to develop in the metropolitan region. The Metropolitan Council now estimates that the region's current landfill capacity will be used up by 1993. The capacity limit relaxes somewhat as distance from the Twin Cities increases. For example, the southwestern part of the state appears to have capacity sufficient to last into the long-run.

The Regional Solid Waste Management Task Force recommended some changes in law that were intended to ease facility siting problems in the region. These recommendations were included in a group of Waste Management Act amendments proposed during this year's legislative session. The proposed amendments did not pass into law this year. The reasons for failure were not related to the amendments recommended by the metropolitan region solid waste management task force. The recommended changes deserve further consideration.

The MPCA makes no recommendation on new regulations in this report. A number of policy changes have taken effect lately (e.g., yard waste bans, recycling subsidies, financial assurance exemptions) that will affect disposal capacity in the short-term. Although these effects will increase disposal capacity, it is too soon to tell the extent of the increase. The MPCA recommends instead that full information on recent changes be compiled and analyzed and that the quality of information on the solid waste management sector be improved.

Feasible regulatory action by state authorities cannot ease the limits on solid waste processing and disposal system capacities. It is a matter to be handled by permittees and regional planners. Many facility permittees now believe that current regulations are too stringent. However, landowners in the neighborhood of existing or planned facilities do not believe the regulations are strong enough. The objections of property owners are now the most significant factor limiting capacity increases. The stringency of environmental safety regulations matters less than local political opposition when solid waste management facilities are being sited or expanded.

The MPCA recommends legislative review of laws relating directly and indirectly to the siting and permitting of solid waste facilities. The review should focus on the sometimes conflicting authorities of local governments (land use planning), county governments (solid waste management planning), and state government (environmental regulation and solid waste planning). Conflict between these authorities is probably unavoidable in many cases. However, the delays recently caused by a series of local conflicts now severely limit capacity development.

The MPCA recommends that the legislature's review be directed toward developing faster methods of conflict resolution. Some methods deserving attention are: environmental mediation, fixed time limits on local government decisions, and a reallocation of regulatory authorities so that authorities coincide with responsibilities.

The Adequacy of Facility Fees

Section 3 presented discussion of the relationship of solid waste management costs to facility fees. Appendix section 5 presents estimates of indirect costs that are not covered by facility fees. Some of the indirect costs relate to programs that subsidize solid waste management alternatives to land disposal. Program goals and support levels have been set by initial legislative action. Some additional legislative action is required from time to time to continue capital grant programs.

Other indirect costs relate to corrective action at mixed municipal solid waste land disposal facilities. Program goals were set by initial legislative action. Support levels are reviewed annually and set according to need.

An interrelated set of factors now operates within the solid waste management sector that will change the sector's structure within the next few years. Legislative, regulatory and economic forces will combine to increase total costs. However, the effect of these forces on facility fees is less clear. The extent of fee increases will depend on the tradeoffs made between direct and indirect costs. The MPCA is now evaluating the information that is needed to determine with precision the extent to which facility fees fall short of total costs. The MPCA can make this assessment available to the LCWM in a special

report or reserve assessment until next year's edition of this report is due. The MPCA prefers, in the interest of careful assessment, to defer presentation until next year.

The MPCA recommends an expanded legislative review of facility fees. Facilities throughout the state assess surcharges. The surcharge proceeds go to local and state governments. The total surcharges vary from site to site, causing rate differentials that influence local and regional waste flows. The sources and uses of funds generated by solid waste surcharges merit legislative attention. Depending on local enforcement efforts and spending decisions, the surcharges' impacts on waste generators will vary between regions.

Information

Underlying all issues on solid waste management policy is a question about the quality of information on which policy decisions are based. The permits issued by the MPCA's Ground Water and Solid Waste Division require facility operators to submit annual operating reports. Information on facility rates and the amounts of waste handled must be included in the reports. The MPCA does not audit these reports. MSW incinerators receive their permits from the MPCA's Air Quality Division, which does not now require annual operating reports. Rules now proposed for MSW incinerators will require annual reports like those supplied by other solid waste management facilities. (The information in Section A on incinerator rates and waste handled was supplied voluntarily by facility operators.)

The operators of yard waste compost facilities and recycling facilities are also required to send in annual operating reports. Yard waste compost facility operators generally have met this requirement once they are told of their reporting responsibilities. However, recyclers have proven reluctant to submit complete annual reports because they do not want the information in the reports to be made public. Staff members of the MPCA, the Office of Waste Management, and the Metropolitan Council continue to work on estimates of recycling activity, but these estimates are usually qualified because data sources are informal at best.

Some steps can be taken to improve the quality of information about the solid waste management sector.

1. Require recyclers who receive state grants or loans to submit complete annual reports in compliance with the conditions of their permits.

   The MPCA has received annual reports from recyclers, however a number of these reports have no information on sales destinations. A recent study conducted for the Metropolitan Council reports that recyclers do not intend to meet this reporting responsibility because they do not want the MPCA to have information about recycling markets. They regard this as information that would hurt their competitive positions if it were available to other recyclers.

   Although recyclers have been advised of the laws and rules on data confidentiality, the market reporting requirement is still regarded as unfair and inequitable. One way to handle this problem would be to revoke the permit-by-rule status of any recycler who does not submit a complete annual report. This would prove a rather extreme remedy, since the time and costs involved in making a formal permit application would likely prove too high for small-scale recyclers.

As an alternative to enforcement action, the MPCA recommends tying state financial aid to submission of acceptable reports and substantial compliance with all state regulations. Most recyclers benefit from some state financial aid. The possibility of losing this aid should provide enough incentive to make sure that most reports are received. In the interests of equity, it would be advisable if the reporting condition were made for all solid waste management firms that receive state aid.

2. Sector-wide and facility-specific surveys.

A lot of the data uncertainty can probably be eliminated through independent tests. Without actually measuring detailed elements of the solid waste management sector, a sample taken from within the sector can be used to test estimates that are developed for the entire sector.

a. Total solid waste management costs.

A simple mailed survey to a sample of waste generators could be used as a check on the total costs estimates presented in Section 1 of this report. The survey would request information on collection and disposal charges. Sampling methods are well enough established to make the survey a relatively simple project.

Survey results could also provide insight into the status of competition in the solid waste management sector. A wide range of reported rates would indicate less competition in some regions. A narrow range of rates would indicate a fairly uniform distribution of competitive conditions.

b. Adequacy of fees.

This survey would require detailed examination of financial records for selected facilities. Many local governments own and operate solid waste processing and disposal facilities. Financial records for these facilities should be available for review. A sample of facility financial reports could be used to determine the extent to which fees fall short of costs.

A more intensive, facility-by-facility, survey of long-term care costs would also prove useful. This survey would cover all permitted land disposal facilities. These facilities have submitted to the MPCA reports on the estimated costs of facility closure, postclosure care, and contingency action. The MPCA staff is now reviewing the reports. The result of this review will be a compilation of long-term care costs for each operating facility. This information can be compared with the surveys of individual facilities' financial data and Superfund cost forecasts to refine the assessment of the adequacy of fees.

c. Solid waste processing and disposal capacity.

Land disposal facility operators are now also required annually to submit topographic surveys of their facilities. Comparison of annual surveys will provide a much better remaining capacity estimate by the time the 1991 is due.

The information from these four recommended survey projects would improve the analytical basis of next year's report.

General Recommendations

The MPCA also presents recommendations that relate more directly to protection of human health and the environment.

First, the MPCA directs legislative attention to narrative reports that illegal solid waste dumping is starting to increase. These reports come from the Department of Natural Resources and from county government officials. Empirical data are not yet available to define the extent of the problem.

The 1989 Legislature passed a law that imposed penalties on people who illegally use dumps. The same law made grants available for local government enforcement programs. The MPCA recommends that the legislature carefully watch the progress of local enforcement programs. If local governments lack the resources to meet their goals in dump control, the MPCA recommends that state assistance be added to the local enforcement effort. The assistance may be rendered as in-field enforcement work or legal assistance in prosecution.

Second, the MPCA recommends legislative consideration of broadening administrative enforcement authority. Current procedures limit the MPCA to extremely time-consuming enforcement measures. Enforcement actions require approval by the MPCA Board. The actions are limited to facility closure orders at permitted facilities.

Violations vary with respect to their impact on human health and the environment. When violations are severe, facility closure is an appropriate enforcement action. However, in less severe cases, when threats to human health and the environment are not extreme or imminent, facility closure is not an appropriate enforcement action.

The MPCA can provide better public service with an array of intermediate enforcement measures that can be selected from to fit the severity of the violation. An authority to "write tickets" would fill this need. Extending such authority to the MPCA will require legislative action and MPCA rulemaking.

Third, the MPCA recommends legislative consideration of a permit fee system that makes fees at least roughly proportionate to regulatory efforts. A system of this sort effectively would build into facility fees the costs of solid waste regulation. The system could also serve future legislatures as an indicator of the effectiveness of regulatory programs.

APPENDIX

APPENDIX

1. SOLID WASTE GENERATED IN MINNESOTA

A. State Solid Waste Policy Report

The Minnesota Pollution Control Agency (MPCA) submitted in 1988 a Solid Waste Policy Report to the Legislative Commission on Waste Management (LCWM). That report compared waste generation estimates from three different analyses. The estimates were based on 1986 data. The estimates of annual waste generation ranged from 3.1 million tons per year to 3.4 million tons per year. The table following presents the estimates in greater detail.

TOTAL SOLID WASTE GENERATION ESTIMATES
GREATER MINNESOTA/METROPOLITAN AREA

	MPCA LANDFILL (1986) REPORTS*	COUNTY ESTIMATES MPCA SOLID WASTE PLAN STATUS 3/5/87 (1985/86 data)	MPCA - COST ESTIMATING MODEL FOR A CONTINGENCY ACTION FUND* (1986)
Greater Minnesota	tons/day-3079 tons/year-1,123,943	tons/day-3273 tons/year-1,004,845	tons/day-3992 tons/year-1,457,041
Metropolitan Area	tons/day-5329 tons/year-1,944,933	tons/day-5631 tons/year-2,055,315	tons/day-5236 tons/year-1,911,145
TOTAL	tons/day-8408 tons/year-3,068,876	tons/day-8904 tons/year-3,249,960	tons/day-9228 tons/year-3,368,168

* Figures reported as cubic yards per year. Converted to tons using 1 ton = 3.333 cubic yards. For daily tonnage a 365 day year is used.

B. Facility Operating Reports

Most solid waste processing and disposal facility operators send operating reports to the MPCA. The reports include statements of the amounts of waste handled at permitted facilities.

Reports from 1988 indicate that about 4.8 million tons of solid waste were generated. New data account for the difference between the estimate in the Solid Waste Policy Report and the information in the compiled operating reports. The Solid Waste Policy Report relied on 1986 data, a time when none of the metropolitan region's large incinerators were operating. The report also did not take into account the reports of demolition waste, industrial waste and solid waste exports.

SOLID WASTE DISPOSAL DATA FROM SOLID WASTE FACILITIES' OPERATING REPORTS
(cubic yards)

FACILITY TYPE

YEAR	Demo	Industrial	Resource Recovery	MSW	TOTAL
1980	0	0	0	10,737,701	10,737,701
1981	0	0	0	10,392,006	10,392,006
1982	369,313	374,120	0	9,985,274	10,728,708
1983	351,745	313,838	57,097	10,274,589	10,997,269
1984	386,719	573,523	8,117	10,541,890	11,510,249
1985	509,513	595,330	532	10,477,007	11,582,381
1986	644,771	688,751	6,130	10,765,119	12,104,770
1987	1,116,978	696,124	749,153	9,800,797	12,363,053
1988	1,448,620	732,168	1,405,356	9,841,452	13,427,596

ESTIMATED VALUES

YEAR	Recycling	Compost	Incineration	Exports	Grand Total
1980	143,169	11,931	0	262,362	11,155,163
1981	277,120	23,093	0	254,179	10,946,399
1982	399,411	33,284	0	262,690	11,424,093
1983	551,023	45,919	0	269,435	11,863,646
1984	703,334	58,611	0	282,618	12,554,812
1985	838,203	69,850	0	284,400	12,774,835
1986	1,005,317	83,776	0	297,833	13,491,696
1987	1,200,699	100,058	706,599	304,326	14,674,735
1988	1,497,639	124,803	1,233,520	333,000	16,616,558

1. Data reported in tons were converted at the following rates:

   MSW = 600 pounds per cubic yard

   ash = 2,000 pounds per cubic yard

2. Total recycling activity in 1988 is assumed to equal 12 percent of the MSW waste stream.

3. Total composting activity in 1988 is assumed to equal 1 percent of the MSW waste stream.

4. Estimates of solid waste exports are based on narrative reports received by the MPCA's regional offices.

The table following presents more detailed information on the total amount of solid waste generated in Minnesota.

HISTORICAL DATA FROM FACILITY OPERATING REPORTS
(cubic yards of solid waste received)

	1980	1981	1982
ALL SOLID WASTE			
Statewide	10,737,701	10,392,006	10,728,708
Metro	5,647,869	5,167,293	5,621,210
Non-metro	5,089,832	5,224,713	5,107,498
MSW LANDFILLS			
Statewide	10,737,701	10,392,006	9,985,274
Metro	5,647,869	5,167,293	5,152,351
Non-metro	5,089,832	5,224,713	4,832,923
DEMOLITION LANDFILLS			
Statewide	0	0	369,313
Metro	0	0	265,865
Non-metro	0	0	103,448
INDUSTRIAL LANDFILLS			
Statewide	0	0	374,120
Metro	0	0	202,993
Non-metro	0	0	171,127
RESOURCE RECOVERY			
Statewide	0	0	0
Metro	0	0	0
Non-metro	0	0	0

HISTORICAL DATA FROM FACILITY OPERATING REPORTS
(cubic yards of solid waste received)

	1983	1984	1985
ALL SOLID WASTE			
Statewide	10,997,269	11,510,249	11,582,381
Metro	6,016,748	6,648,157	7,167,425
Non-metro	4,980,521	4,862,093	4,414,956
MSW LANDFILLS			
Statewide	10,274,589	10,541,890	10,477,007
Metro	5,601,881	6,226,620	6,486,650
Non-metro	4,672,708	4,315,271	3,990,357
DEMOLITION LANDFILLS			
Statewide	351,745	386,719	509,513
Metro	219,860	150,266	365,729
Non-metro	131,885	236,453	143,784
INDUSTRIAL LANDFILLS			
Statewide	313,838	573,523	595,330
Metro	137,910	263,154	314,515
Non-metro	175,928	310,369	280,815
RESOURCE RECOVERY			
Statewide	57,097	8,117	532
Metro	57,097	8,117	532
Non-metro	0	0	0

HISTORICAL DATA FROM FACILITY OPERATING REPORTS
(cubic yards of solid waste received)

	1986	1987	1988
ALL SOLID WASTE			
Statewide	12,104,770	12,363,053	13,427,595
Metro	7,504,237	8,133,367	8,517,731
Non-metro	4,600,533	4,229,686	4,909,865
MSW LANDFILLS			
Statewide	10,765,119	9,800,797	9,841,452
Metro	6,679,264	6,175,275	5,615,568
Non-metro	4,085,855	3,625,522	4,225,884
DEMOLITION LANDFILLS			
Statewide	644,771	1,116,978	1,448,620
Metro	460,746	863,391	1,217,848
Non-metro	184,025	253,587	230,772
INDUSTRIAL LANDFILLS			
Statewide	688,751	696,124	732,168
Metro	364,227	372,281	391,465
Non-metro	324,524	323,843	340,703
RESOURCE RECOVERY			
Statewide	6,130	749,153	1,405,356
Metro	0	722,420	1,292,850
Non-metro	6,130	26,733	112,506

2. CAPACITY OF SOLID WASTE MANAGEMENT FACILITIES

This section will focus on the permitted capacities of MSW land disposal facilities. Demolition waste facilities and industrial waste facilities have current capacity that is sufficient to meet both short-and long-term needs.

A statewide look at MSW land disposal facility capacity shows that there is probably enough room to take care of landfill needs for the next few years. The table following presents the permitted MSW land disposal facilities, their estimated capacities, their average annual rates of waste receipts, and their reported waste receipts for 1988. The capacity classes in the table represent:

A: four more years of remaining capacity at current disposal rates
B: two more years of remaining capacity at current disposal rates
C: one more year of remaining capacity at current disposal rates
D: closed, closing or not now accepting waste

Facility	Capacity class	Annual avg.	1988
METRO REGION			
Pine Bend SLF	A	2,121,441	2,837,903
Burnsville SLF	A	509,647	1,092,064
Louisville SLF	C	592,818	664,351
Anoka Municipal SLF	C	802,759	261,499
Woodlake SLF	C	331,298	471,028
Freeway SLF	C	130,570	87,025
East Bethel SLF	D	116,315	185,689
Dakhue SLF	D	130,183	7,467
Flying Cloud SLF	D	875,212	6,908
Waste Disposal Eng.SLF	D	141,350	1,634
Oak Grove SLF	D	262,788	
REGIONAL TOTAL		5,615,568	
DULUTH REGION			
Cook Co. SLF	A	5,204	5,337
East Mesaba SLF	A	170,846	92,500
Koochiching SLF	A	46,549	34,789
Vermillion Dam Mod. LF	A	4,938	0
Carlton Co. SLF #2	A	49,054	1,793
South Carlton SLF	A	8,746	10,031
Hudson SLF	B	21,897	22,792
Vermillion Mod. LF	B	19,345	6,467
Floodwood Area Mod. LF	B	5,829	0
Grand Rapids SLF	B	156,853	75,306
Hibbing SLF	C	222,838	105,814
WLSSD SLF	C	155,216	40,872
Lake Co. SLF	C	50,155	51,803
Cotton Area Mod. LF	C	4,876	7,622
Northome Mod. LF	C	4,043	3,053
City of Hoyt Lakes SLF	C	6,080	3,267
Aitkin Area SLF	C	17,158	21,125
Hickory Grove SLF	C	7,386	9,801
Northwoods SLF	C	32,486	21,847
Hwy. 77 Seasonal SLF	D	3,148	3,710
Cook Area Mod. LF	D	8,448	9,800
Portage Mod. LF	D	3,969	1,594
Iron Range SLF	D	26,699	0
Orr SLF	D	1,466	0
Brookston Area Mod. LF	D	3,871	4,163
REGIONAL TOTAL		533,485	

Facility	Capacity class	Annual avg.	1988
BRAINERD REGION			
Cass/Remer SLF	A	7,797	3,152
Yonak SLF	A	81,454	206,141
Cass Co. Walker-Hackensack SLF	A	13,280	7,474
Elk River SLF	B	400,828	552,012
Isanti/Chiscago SLF	B	44,130	
Lindala SLF	C	32,549	41,690
French Lake SLF	C	6,966	10,791
Greater Morrison SLF	C	58,093	
Long Prairie SLF	C	20,493	34,357
Crow Wing SLF	C	102,331	108,533
Pine Lane SLF	C	150,381	56,495
Kanabec SLF	C	33,368	35,594
Lindenfelser SLF	D	63,154	11,394
St. Augusta SLF	D	181,061	
Anderson SLF	D	5,353	
Korf Bros. SLF	D	31,659	47,620
Sauk Centre SLF	D	11,710	2,969
Crosby SLF	D	9,617	
Bueckers SLF	D	15,998	15,353
H. F. Killian SLF	D	18,017	
Paynesville SLF	D	101,233	539,232
Maple SLF	D	18,976	
City of Wadena SLF	D	13,385	
Fifty Lakes Mod. LF	D	4,047	1,543
REGIONAL TOTAL		1,674,350	
DETROIT LAKES REGION			
Anderson Kittson Co. SLF	A	7,736	6,233
Fergus Falls SLF	A	44,226	22,802
Salol SLF	A	32,012	44,214
Polk Co. SLF	A	76,210	111,562
Clay Co. SLF	B	95,054	97,586
Stevens Co. SLF	B	13,378	2,430
Lake of the Woods SLF	C	8,266	10,278
NE Otter Tail SLF	C	24,281	27,409
Becker Co. SLF	C	76,196	90,152
Kluver SLF	C	39,047	14,309
Northwest Angle Mod. LF	D	341	51
Karlstad SLF	D	2,032	
Mahnomen Co. SLF	D	8,447	
LaGrand SLF	D	23,221	
Kummer SLF	D	46,731	
Leech Lake Reser. SLF	D	26,587	
Pickett SLF	D	10,808	
Battle Lake Area SLF	D	6,430	
Camp Ripley	D	2,595	
REGIONAL TOTAL		427,026	

Facility	Capacity class	Annual avg.	1988
MARSHALL REGION			
Jackson Co. SLF	A	10,760	10,096
McLeod Co. SLF	A	110,739	178,910
Big Stone Co. SLF	A	18,260	8,432
Lyons SLF	A	57,037	57,991
Tostenson Gabrielson SLF	A	43,421	35,058
Pipestone SLF	A	45,575	44,359
Redwood Co. SLF	A	25,370	23,127
Kandiyohi Co. SLF	A	65,477	61,394
Murray Co. SLF	A	13,093	12,987
Rock Co. SLF	A	22,373	24,723
Renville Co. SLF	B	30,307	24,649
Nobles Co. SLF	B	39,833	44,821
Cottonwood SLF	B	14,826	19,334
Lenzen SLF	B	20,723	8,181
Meeker Co. SLF	C	13,777	7,929
City of Benson SLF	C	12,232	12,837
Lincoln Co. SLF	D	165	30
REGIONAL TOTAL		574,858	
ROCHESTER REGION			
Red Wing SLF	A	21,691	7,977
Watonwan Co. SLF	A	37,702	48,860
Tellijohn SLF	A	75,846	112,389
Waseca Co. SLF	A	42,633	44,921
Rice Co. SLF	A	104,153	135,396
Faribault Co. SLF	A	49,112	64,690
Ponderosa SLF	A	167,334	177,374
Sun Prairie (Reak) SLF	B	6,105	1,248
Dodge Co. SLF	B	12,653	13,302
Albert Lea SLF	B	109,491	144,130
Brown Co. SLF	C	52,454	42,477
Steele Co. SLF	C	92,547	92,841
Winona SLF	C	112,025	112,269
Ironwood SLF	D	74,027	
Wabasha Co. SLF	D	17,215	18,290
Sibley Co. SLF	D	10,549	
Goodhue Co-op SLF	D	11,078	
Houston Co. SLF	D	27,538	
Red Rock SLF	D	29,218	
Hansen SLF	D	30,026	
Gofer SLF	D	31,538	
Adams SLF	D	2,192	
Olmsted Co. SLF	D	231,653	
REGIONAL TOTAL		1,016,165	

Reports from the different classes of facilities are presented below:

Facility class	1988 waste receipts (c.y.)	Annual average (c.y.)
A	5,524,679	4,089,718
B	1,012,258	991,252
C	2,447,068	3,192,687
D	857,447	2,640,050

As smaller facilities have closed in recent years, larger facilities have been able to take the extra waste. However, the presentation of statewide data does not reflect some regional differences. The greatest difference between capacity and need is in the metro region.

Metro region facilities

Facility class	1988 waste receipts (c.y.)	Annual average (c.y.)
A	3,929,967	2,631,089
B	0	0
C	1,483,903	1,857,445
D	201,698	1,525,848

The large metro region landfills that have more capacity are now handling most of the waste that is landfilled within the region. The landfills that have the greatest remaining capacity received wastes in 1988 at a rate 50 percent greater than their ten-year average. The rate of waste receipts is increasing at the landfills that have the most capacity.

Solid waste incinerators have recently begun to ease some of the pressure on landfill capacity. Incinerator operators' reports to the MPCA show that the following amounts of waste were burned.

Year	Waste burned	Per cent of permitted capacity
1987	706,599 c.y.	24.4
1988	1,233,520 c.y.	42.6
1989	2,072,923 c.y.	33.9

As incinerators increase their scale of operations, they will handle more of the state's solid wastes. Bear in mind also that incinerator shutdowns, whether temporary or permanent, imply sharp local increases in the demand for landfill capacity.

The 1988 Legislature banned yard wastes from landfills and resource recovery facilities. The ban took effect this year in the metro region. It takes effect in 1992 throughout the rest of the state. This ban will ease the demand for landfill capacity. It will also increase the demand for yard waste compost facility capacity. This demand is now being met by local governments in the metro region.

The 1989 Legislature passed a series of measures designed to promote recycling. The metro region has implemented a variety of recycling programs in the past few years. The Metropolitan Council reports that about 250,000 tons were recycled during 1988 in the metro region. This amount comes from source separation programs. The materials recycled through these programs amount to about 12 percent of the region's mixed municipal solid wastes. The 1994 goal for all metro region recycling programs is 35 percent. The 1994 recycling goal for the rest of the state is 25 percent.

The MPCA has received reports of about 4,000 tons of materials recycled outside the metro region in 1989. These reports come from people seeking permit-by-rule status as recycling facility operators. The reports are incomplete. The MPCA is still receiving reports from recycling facility operators, and it will likely not be possible until late this year to compile recycling data for Greater Minnesota.

Successful recycling programs will lead to lower demand for landfill space. As with yard waste compost programs, the recycling programs' success carries with it an increased demand for capacity at recycling facilities. Local governments are reported now to be meeting the local demand for recycling capacity. However, on a regional or statewide basis, there is some narrative evidence that the firms that process recycled materials do not yet have the capacity needed to handle the increased supply.

3. ECONOMIC OUTLOOK FOR MINNESOTA

Econometric Forecast

A statistical model of the Minnesota economy is available for making forecasts of selected economic variables. The Department of Revenue and other state agencies use this model to forecast the economic impacts of proposed projects, laws and rules.

The table following presents gross regional product information for Minnesota. Output information for individual sectors is also available.

GROSS REGIONAL PRODUCT BY FINAL DEMAND
(BILLIONS OF 77 US DOLLARS-RECONCILED WITH VALUE ADDED)

	1981 HIST	1982 HIST	1983 HIST	1984 HIST	1985 HIST
GRP 1977 $	39.631	39.388	40.322	44.170	46.152
PCE-PRICE INDX-77	142.247	150.150	154.981	160.372	164.292
NOMINAL $	56.374	59.141	62.491	70.836	75.824

	1986 HIST	1987 HIST	1988 HIST	1989 FCST	1990 FCST
GRP 1977 $	47.983	50.106	51.741	53.288	54.863
PCE-PRICE INDX-77	168.022	173.411	180.538	189.621	199.365
NOMINAL $	80.622	86.889	93.412	101.045	109.378

	1991 FCST	1992 FCST	1993 FCST	1994 FCST	1995 FCST
GRP 1977 $	57.720	57.703	56.361	61.554	67.463
PCE-PRICE INDX-77	210.536	224.346	236.311	246.678	258.104
NOMINAL $	121.521	129.454	133.188	151.842	174.125

	1996 FCST	1997 FCST	1998 FCST	1999 FCST	2000 FCST
GRP 1977 $	71.397	73.854	75.037	77.396	79.926
PCE-PRICE INDX-77	271.928	287.762	302.048	312.332	326.843
NOMINAL $	194.148	212.524	226.648	241.736	261.232

CONTROL FORECAST MADE 3-28-90

4. DIRECT COSTS OF SOLID WASTE MANAGEMENT

A. State Solid Waste Policy Report

The 1988 State Solid Waste Policy Report included estimates of solid waste management costs incurred outside the metro region. The total cost estimate for 1986 came to about $100 million. Applying the same methodology to the metro region yields a $166 million total cost estimate. Minnesota's population in 1986 was 4.2 million. This means solid waste management costs per capita were estimated at about $63.

Statewide gross output in 1986 was $80.6 billion. The Policy Report's estimate of solid waste management costs amounts to about 0.3 percent of total output.

B. Facility Operating Reports

The facility operating reports for 1989 have information on the rates charged for solid waste processing and disposal services. Not all operators had sent in their reports when this report was compiled. However, the sample of reports available can be used as the basis for an estimate.

The MSW land disposal facilities for which reports were received handled about sixty percent of all landfilled mixed municipal solid wastes. These facilities have rates that apply to different units of waste received. Packer trucks carry most waste to landfills, so the estimates made here assume that the rate charged to packer trucks applies to all waste.

Bear in mind that some people haul their own waste to landfills. These wastes are not as dense as the wastes hauled in packer trucks. This means that the cost estimate based on the packer truck rate probably understates actual total costs. The difference probably does not amount to much, since few people haul their own wastes.

Landfill operators in 1988 reported handling 9.9 million cubic yards of waste. The 1989 operating reports had a weighted average rate for packer trucks of about $11.50 per cubic yard. These charges ranged from $3.75 per cubic yard to $20 per cubic yard. If the amount of landfilled wastes did not change much from 1988 to 1989 and if the distribution of charges at the non-reporting facilities is similar to the distribution for reported charges, the total costs of land disposal in 1989 can be estimated:

9.9 million cubic yards X $11.50 = $113.85 million

Similar methods can be used to estimate costs for demolition landfills and resource recovery facilities:

Demolition waste landfills

1.4 million cubic yards X $3.40 = $4.9 million

Resource recovery facilities

2.6 million cubic yards X $18.00 = $46.8 million

No rates were reported for the industrial waste land disposal facilities. Industrial facilities are run by private firms to handle the wastes from each individual firm's production activities. Industrial facility permittees do not charge rates because they do not accept wastes from outside the firm. Still, facility development, operation, and long-term care are costly activities. If it is assumed that industrial facility costs have the same distribution as MSW facility costs, then total costs can be estimated:

0.9 million cubic yards X $11.50 = $10.35 million

Total estimated costs (in $ millions) for all permitted and reporting facilities add up to:

mixed municipal solid waste	$ 113.85
demolition waste	4.90
resource recovery	46.80
industrial waste	10.35
	$ 175.90

This amounts to a total cost per capita of about $41.

This estimate leaves unaccounted about twelve percent of the solid waste generated. These are the wastes that are recycled, composted or exported to neighboring states. The Metropolitan Council has reported regional recycling costs of $66 per ton and yard waste composting costs of $44 per ton. Near Minnesota's borders, some solid wastes are taken to other states because land disposal facility charges are lower. The MPCA has no data on specific out-of-state disposal fees. Assume, for estimating purposes, that out-of-state charges are half the Minnesota average. Total cost estimates (in $ millions) for the unreported part of the Minnesota's solid wastes are:

Waste type	Amount (million c.y.)	Charge rate ($/c.y.)	Total cost
recyclables	1.5	$20	$30.0
compost	0.1	13	1.3
exports	0.3	6	1.8
Total			$32.1

Adding this estimate to the estimates based on facility operating reports yields a total cost estimate for solid waste processing and disposal of $208 million. This amounts to about $48 per capita.

Collection and Transportation

There is another important component of solid waste management costs. Most of Minnesota's solid wastes are taken to processing and disposal facilities by private waste hauling firms. These firms pick up wastes from households, business firms and other institutions, and take the wastes to permitted processing and disposal facilities. Solid waste collection and hauling is a relatively labor intensive activity. It also takes a lot of time. The time and labor involved make waste collection and hauling the most costly part of the total bill for solid waste management.

Conventional wisdom has long held that collection and hauling comprise 80 percent of total solid waste management costs. This assumption has lately been changing in response to rising processing and disposal facility costs. Some analysts now estimate that the collection and hauling bill has been reduced in proportion so that it now comprises 70 percent of total solid waste management costs. This assumption has not been tested in Minnesota, although there is ample evidence that processing and disposal costs are increasing.

A range can be calculated based on two rather simple limiting assumptions about the relation of hauling and collection charges to total costs. For the lower end of the scale, assume that collection and hauling charges comprise 70 per cent of total solid waste management costs. For the higher end of the scale, assume these charges are 80 percent of total costs. The resulting estimates are:

Solid Waste Management Costs
($1,000,000s)

Collection & hauling Total cost	Processing & Disposal	Collection & Hauling	Total Cost
80%	$ 208.0	$ 832.0	$ 1,040.0
70%	208.0	485.0	693.0

Solid Waste Management Costs
($ per capita)

Collection & hauling Total cost	Processing & Disposal	Collection & Hauling	Total Cost
80%	$ 48	$ 193	$ 241
70%	48	113	161

Information about costs has only a limited meaning until it is placed in relation to the rest of the state's economy. The solid waste management budget must be met from the pool of resources created by general economic activity. The estimate of solid waste management costs can be translated into a proportion of total economic activity; a measure of the amount of the state's total income that is used directly to pay for solid waste management. Gross regional product for 1988 was $93.4 billion. Relating solid waste management costs to total output yields:

Solid Waste Management Costs
(as a percent of gross state product)

Collection & hauling Total cost	Processing & Disposal	Collection & Hauling	Total Cost
80%	0.22	0.89	1.11
70%	0.22	0.52	0.74

C. Metropolitan Council Analyses

The Metropolitan Council has in recent years published regular reports on the progress of landfill abatement programs in the region. The Council's findings are not properly applied to the rest of the state. Still, these findings can be instructive of the relationship of solid waste management costs to income and output.

The Council in its 1988 waste abatement report estimated regional solid waste management costs at: $69.6 million for processing and disposal, $115.5 million for collection and hauling, and $185.1 million for total costs. This estimate is somewhat lower than the estimate derived from facility operating reports submitted to the MPCA.

Part of the difference is explained by noting that the Council's report focused on the MSW stream. The analysis did not include estimates for industrial or demolition waste management costs. Facility operating reports indicate that industrial and demolition wastes comprise about 18 percent of the metro region's solid wastes. So the total cost estimate derived from facility operating reports begins from a larger base.

Another source of difference is in the rates used to calculate the total costs. Recall that the total cost estimate based on facility operating reports is made by using an average of reported 1989 fees. The 1989 fee data are used because 1990 is the first year in which the MPCA has received statewide data on solid waste management facility fees. The Council's analysis is based on an average of 1988 fees. Narrative reports indicate that solid waste management processing and disposal fees have been increasing in recent years, especially in Greater Minnesota.

Finally, the Council's estimates indicate that collection and hauling costs comprise about 60 percent of total solid waste management costs. This is rather lower than the 70 percent to 80 percent relation assumed in the statewide estimate that is based on facility operating reports. When allowances are made for all these analytical differences, the two estimates are not very much different.

The forecasting model that provided the measure of total economic output does not make estimates for sub-state regions. However, data available from the U.S. Commerce Department show that the metro region accounts for about 60 percent of the state's total personal income. Assuming that output is distributed the same as income, economic output for the metro region can be estimated at $56 billion. The Council's estimate of $185 million in solid waste management costs amounts to 0.33 percent of estimated regional output. This is a little less than half of the lower bound estimate for statewide solid waste management costs. It is nearly the same proportion of total output that was estimated in the State Solid Waste Policy Report.

D. Estimates from Cost of Living Analyses

The Legislative Auditor's Office in 1988 analyzed cost of living patterns throughout the state. The analysis was made to determine regional differences in living costs.

This study assumed that refuse collection costs comprised 0.26 percent of the typical household budget in Minnesota. This estimate is still lower than the estimate derived from facility operating reports. Some of the difference is explained by the source of the cost of living study data. The cost of living study used methods originally developed in Florida in 1987. Although a number of items in the "market basket" were adjusted to agree with data from Minnesota, the refuse collection item was held constant. So the cost of living study assumed a value for refuse collection that waste estimated in Florida in 1987.

The value assumed for household refuse collection costs thus has no strong connection to the solid waste management cost estimates derived from facility operating reports. However, the cost of living study does provide an indication that the estimates based on facility operating reports are not ridiculously low.

5. INDIRECT COSTS OF SOLID WASTE MANAGEMENT

Section 3 presented estimates of direct solid waste management costs. These are the costs incurred at solid waste processing and disposal facilities for operations, maintenance, and debt service. There are other costs associated with solid waste management that are not related directly to facility operations. These costs are associated with public sector solid waste management programs. Some of these programs offer financial incentives to solid waste processing and disposal facilities. Other programs are used to correct ground water contamination problems that are caused by landfill operations.

This section presents estimates of the indirect costs of solid waste management. The information in this section is less complete than the information on direct costs. The programs involved are administered by different governments, which usually means that information is compiled at different times and under different accounting rules.

The estimates in this section probably understate indirect costs because some costs are not even included. For example, the costs of running state and local government regulatory and educational programs are not included.

A. Environmental Response, Compensation and Compliance Fund (Superfund)

The state Superfund was established in 1983 to provide money for investigation and cleanup of contamination incidents. The fund is developed from fees charged to firms that generate hazardous wastes and general fund appropriations. The MPCA makes annual reports to the LCWM on the Superfund's status. The information in this section is taken from the status report submitted in November, 1989.

The Superfund has been used to address contamination problems at a number of the state's MSW land disposal facilities. There are now 56 such facilities on the Superfund list. Some of these facilities are also on the federal Superfund list.

Money spent through these programs has so far mostly come from the federal Superfund or from the individuals, firms or institutions identified as responsible parties. About $3.4 million in federal dollars and $800,000 in state Superfund money have been spent, as of the end of the 1989 fiscal year. Current estimates indicate the state Superfund needs about $100 million over the next five years. This expenditure will be needed to address problems at 23 of the 56 facilities now on the Superfund list.

The total costs of paying for landfill cleanups is expected to increase as more contamination incidents are found and more sites are added to the Superfund list. The MPCA estimates that the final bill for the 56 sites now on the Superfund list will be between $140 million and $253 million.

B. Metropolitan Landfill Contingency Action Fund (MLCAF)

The MLCAF was established in 1984. This fund is developed from the proceeds of user fees charged at metro area landfills. The fee was originally $0.25 per cubic yard. The 1989 Legislature increased the fee to $0.50 per cubic yard. The MLCAF is set up to ensure proper closure and postclosure care of metro area landfills. The MPCA annually makes a report to the LCWM on the status of the MLCAF. Information in this section is taken from the report submitted for fiscal 1989.

The balance in the fund at the end of the 1989 fiscal year was $6.7 million. As of that date, about $48,000 had been spent on the closure of one facility. Funded activities are expected to increase in the near future, as shown in the following table.

TABLE 4. MLCAF Revenue and Expenditures.
(Corrected Errata 1989 MLCAF Annual Report)

	FY 1989 (actual)	FY 1990 (est.)	FY 1991 (est.)	FY 1992 (est.)	FY 1993 (est.)
Balance Forward	$5,141,722	$6,746,885	$7,635,848	$8,585,799	$9,753,714
Prior Year-Adjustments	7,929	0	0	0	0
Revenue:					
Income (1)(2)	1,403,925(4)	1,123,043	1,140,525	1,172,993	1,003,995
Investments (3)	504,626	607,220	687,226	772,722	877,834
Total Revenue	1,908,551	1,730,263	1,827,751	1,945,715	1,881,829
Expenditures:					
Minnesota Dept. of Health	166,747	120,000	120,000	120,000	120,000
Minn. Dept. of Revenue	40,800	40,800	40,800	40,800	40,800
MPCA Administrative	99,770	102,000	102,000	102,000	102,000
Site Closure/ Postclosure Design & Engineering	4,000	100,000	100,000	-0-	100,000
Construction, Oper., & Maintenance	-0-	478,500	515,000	515,000	40,000
Total Expenditures	311,317	841,300	877,800	777,800	402,800
Balance Forward to Next Year	$6,746,885	$7,635,848	$8,585,799	$9,753,714	$11,232,743

NOTES:

(1) Income through calendar year 1989 consists of 50 percent of the Metropolitan Solid Waste Landfill Fee, which is; a) a $.50 surcharge per cubic yard of unprocessed waste deposited in landfills and b) $.25 surcharge per cubic yard of waste residue deposited in landfills from an energy and resource recovery facility which produces a volume reduction of at least 85 percent from the original volume of waste or a $.50 surcharge per cubic yard from a facility which does not achieve 85% reduction. Amounts collected under each category of surcharge are estimated based on information from the Metropolitan Council and Table 3. Estimates of that portion of the revenues accrued under the $.25 surcharge may be an overestimate because ash from some facilities is not currently deposited in metro-area landfills and is, therefore, not subject to the surcharge.

C. Metropolitan Landfill Abatement Fund (MLAF)

The MLAF was established in 1984. The fund is developed from the proceeds of user fees charges at metro area landfills. The fee was originally $0.25 per cubic yard. The 1989 Legislature raised this fee to $1.50 per cubic yard. The Metropolitan Council uses the MLAF to provide technical and financial assistance to regional landfill abatement programs. The Metropolitan Council makes an annual report to the LCWM on the status of the MLAF. The information in this section is taken from the expenditures and activities report for fiscal 1989.

The Metropolitan Council report provides a history of grant program activities and an estimate of future needs.

Fiscal Year	Total Awards
1986	$ 248,680
1987	848,814
1988	1,042,519
1989	2,184,913
1990 (projected)	3,927,095
1991 (projected)	4,751,030

The balance of the MLAF at the end of fiscal 1989 was about one million dollars. Fee proceeds are expected to increase over the next two year. Fee income is estimated at $3.9 million in 1990 and $5.1 million in 1991.

D. Select Committee on Recycling and the Environment (SCORE)

This committee recommended a series of legislative proposals which resulted in the 1989 Legislature's passage of comprehensive recycling laws. These statutes put in place a recycling program for the entire state. Financial incentives are a substantial part of this program.

The incentive programs are paid for from the proceeds of a sales tax on solid waste collection services. The sales tax is expected to raise about $20 million a year. County governments share about $14 million of the sales tax proceeds. These block grants are to be used to pay for local recycling programs.

E. Capital Grants

The Office of Waste Management (OWM) administers a series of capital grant and loan programs. This Capital Assistance Program (CAP) is funded by the sale of state bonds. CAP funds are given to municipalities that build and operate solid waste management facilities other than landfills. The OWM has received appropriations since 1980 totaling $24.2 million. Qualified municipalities have received $12.8 million in grants and $2 million in loans. The OWM has received applications for another $10.7 million in grants.

F. Indirect Cost Overview

Indirect costs have historically not amounted to a substantial part of the total costs of solid waste management. The indirect costs reported for 1988 amount to a bit less than one percent of estimated total direct costs. The indirect costs of solid waste management amounted in 1988 to about 0.06 percent of total demand from the state and local government sectors.

These proportions are expected to increase throughout the short term. New funds will be available this year to local governments through the new statewide comprehensive recycling program. Cleanup efforts are proceeding at some Superfund sites and will be needed at other sites. The demand for both recycling program support and cleanup activities is more likely to strengthen than weaken, which means indirect costs will probably increase absolutely and relative to total economic output.

6. SOLID WASTE RESPONSIBILITIES AND AUTHORITIES

Solid waste management facilities are subject to an interlocking network of governmental authorities. Some authorities regulate, others develop plans, others administer subsidy programs. The table following presents information on the different government agencies that influence solid waste management.

SOLID WASTE RESPONSIBILITIES AND AUTHORITIES
IN MINNESOTA (July 11, 1988)

	MPCA	Waste Mgmt. Board	Metro Council	AMC/ MICA	Metro Counties	Non-metro Counties	S.W. Mgmt. Districts	RDC's	Cities	Townships	Indian Reservations	Landfill Authorities	Miscellaneous
1. Siting of solid waste facilities	x (intrinsic suitability)	x (mediation)	x (if necessary)		x	x	x (WLSSD)		x	x	x	x	x(fed. lands U.S. Forest Service)
2. Preparing solid waste plans	x (joint state plan) x (federal RCRA plan)	x (joint state plan)	x		x	x	x (WLSSD)	x			x		
3. Review/approval of county solid waste plans													
a. metro counties			x										
b. non-metro counties		x									x		
4. Solid waste management districts													
a. requested					x	x			x	x			
b. approval													
1. metro counties		x	x(reports to WMB)										
2. non-metro counties		x											
5. Implementation, owning/operating solid waste facilities					x	x	x (WLSSD)		x	x	x	x	
6. Flow control implementation					x	x	x (WLSSD)				x		
a. ordinances (approval)													
1. metro counties			x(reports to WMB)										
2. non-metro counties		x											
3. SWM districts		x											
b. ordinances (adopted)					x	x	x				x	x	
7. Permitting of:													
a. compost facilities	x				x	x			x		x		(Army Corps, DNR - if proposed facility is in a floodplain, shoreland or wetland)
b. land disposal	x				x	x			x				
c. incineration facilities	x				x	x			x		x		
d. transfer stations	x				x	x			x	x(zoning)	x		
e. tire facilities		x			x	x			x		x		

	MPCA	Hghwy. Board	MDOT Council	MCA/ MICA	Counties	Counties	Districts	RDC's	Cities	Townships	Reservations	Authorities	Miscellaneous
8. Require financial responsibility	x				x	x			x		x		
9. Service charges for solid waste management (taxes, levies, tipping fees or surcharges)	x		x		x	x	x (WLSSD)		x	x	x	x	
10. Enforcement of solid waste rules													
a. legal action	x	x (tires, planning)			x	x	x (WLSSD)				x(initiate)		
b. inspections	x	x (tires)			x	x	x		x	x	x		
11. Regulation of solid waste													
a. rule	x	x	x(policy				x (WLSSD)						
b. ordinance			plan)		x	x			x	x	x		
12. Operation of abatement programs					x	x	x (WLSSD)		x	x	x	x	x(Dept. of Administration)
13. Regulation of recycling	x	x(flow control)			x	x	x (WLSSD)		x	x	x	x	x(Dept. of Administration)
14. Solid waste grants/loans													
a. planning			x			x (through							
b. capital expenditures		x (statewide)	x			x abatement surcharges)							
c. education		x	x										
d. market development		x	x										
15. Regulation or implementation of sewage sludge programs (as relates to composting)	x				x	x	x (WLSSD)		x		x		x(MWCC implementation)
16. Certificate of need	x		x				x						
17. Technical assistance													
a. public education	x	x	x		x	x	x	x	x	x	x		x(Office of Environmental Resources Development-OTED)
b. technology transfer	x	x	x		x	x	x						x
c. development of legislation	x	x	x	x	x	x	x						x
d. economic/market development program		x	x					x					x(Office of Environmental Resources Development-OTED)

7. COST ESTIMATES FOR FIVE DISPOSAL FACILITY MODELS

TIPPING FEES:

EXISTING TIPPING FEES VARY FROM ZERO FOR COUNTY-OWNED LANDFILLS SUBSIDIZED BY PROPERTY TAXES TO A RANGE OF $1.50 to $10.00 PER CUBIC YARD AT FACILITIES USING A TIPPING FEE.

BASED ON REVISED RULES, TIPPING FEES WOULD NEED TO INCREASE TO PROVIDE FOR CLOSURE/POSTCLOSURE CARE/CONTINGENCY COSTS AS WELL AS THE LINER/COVER DESIGN CHANGES AND MONITORING CHANGES.

AS AN EXAMPLE, A 45-ACRE FILL AREA (ON A 100 ACRE PROPERTY) WOULD RESULT IN THE FOLLOWING TIPPING FEE (EXCLUDING PROFIT, LOCAL CHARGES).

		COST	COST/YD^3
I.	CLOSURE (ASSUME ON-SITE CLAY)	$ 1,178.260.00	$ 0.46
II.	POSTCLOSURE CARE (INCLUDES LEACHATE TREATMENT)	$ 4,838,700.00*	$ 1.90
III.	CONTINGENCY ACTION — CAPITAL	$ 1,481,270.00	$ 0.58
	CONTINGENCY ACTION — OPERATION	$ 1,291,020.00**	$ 0.51
IV.	LINER/LEACHATE COLLECTION	$ 5,072,800.00	$ 2.00
V.	OPERATIONS (INCLUDES MONITORING, LEACHATE TREATMENT)	$15,448,400.00***	$ 6.08
VI.	OTHER SITE CAPITAL COSTS (INCLUDES HYDROGEOLOGIC STUDY)	$ 681,300.00	$ 0.27
		TOTAL TIPPING FEE	$11.80/YD^3

* ASSUMES 20-YEAR POSTCLOSURE CARE PERIOD @ $241,940/YR
** ASSUMES 20-YEAR CONTINGENCY PERIOD @ $64,550/YR
*** ASSUMES 42-YEAR OPERATING LIFE @ $367,820/YR

THE FOLLOWING ASSUMPTIONS SHOULD BE RECOGNIZED IN EVALUATING THE TIPPING FEE OF $11.80/YD^3:

1. ASSUMES A NEW SITE WITH SUFFICIENT TIME TO COLLECT FUNDS.

2. DOES NOT ACCOUNT FOR INFLATION, EARNINGS OF SET-ASIDE FUNDS, OR THE FACT THAT COSTS DECREASE OVER TIME DUE TO STABILIZATION OF THE FILL.

3. CONTINGENCY ACTION COSTS ARE VERY SITE-SPECIFIC AND COULD COST CONSIDERABLY MORE THAN ESTIMATED.

4. COST ESTIMATES ARE BASED ON VALUES RECEIVED ON PROJECT BIDS AND ENGINEERING ESTIMATES.

EXISTING LANDFILL A

ORIGINALLY 20 ACRE FILL ON A 25 ACRE PARCEL.

THE SITE HAS BEEN IN OPERATION 15 YEARS WITH 5 YEARS (121,000 YD^3) REMAINING LIFE.

THERE ARE 5 ACRES TO BE FILLED.

FINAL COVER HAS BEEN PLACED ON 10 ACRES.

TWO MONITORING WELLS EXIST AT THE SITE.

			COST	COST/YD^3
I.	CLOSURE (10-MILE HAUL)		$ 350,000.00	$ 2.90
II.	POSTCLOSURE CARE (INCLUDES LEACHATE TREATMENT)		$ 820,000.00*	$ 6.80
III.	CONTINGENCY ACTION	CAPITAL	$ 1,481,000.00	$12.30
		OPERATION	$ 1,291,000.00*	$10.70
IV.	LINER/LEACHATE COLLECTION		$ 653,000.00	$ 5.40
V.	OPERATIONS (INCLUDES MONITORING, LEACHATE TREATMENT)		$ 425,000.00	$ 3.50
VI.	OTHER SITE CAPITAL COSTS (INCLUDES HYDROGEOLOGIC STUDY)		$ 193,000.00	$ 1.60
			TOTAL TIPPING FEE	$43.20/$YD^3$

* ASSUMES POSTCLOSURE PERIOD OF 20 YEARS @ $41,000/YR
CONTINGENCY PERIOD OF 20 YEARS @ $64,550/YR

THIS COST COULD BE REDUCED NOTICABLY IF A VARIANCE WERE GIVEN ON THE NEED FOR A LINER/LEACHATE COLLECTION SYSTEM.

LANDFILL A ON A VOLUME BASIS WOULD REPRESENT EXISTING LANDFILLS SUCH AS:

1. MAPLE
2. FARIBAULT COUNTY
3. ROCK COUNTY
4. RENVILLE COUNTY (ONLY ONE PROJECTED TO CLOSE IN ABOUT 5 YEARS)
5. LINDALA

EXISTING LANDFILL B
("TYPICAL" MINNESOTA LANDFILL)

ORIGINALLY 20 ACRE FILL AREA ON 25 ACRE PARCEL.

OPERATING 15 YEARS REMAINING CAPACITY FOR 12 YEARS (356,400 YD^3).

ACCEPTS 29,000 YD^3 EACH YEAR.

THERE ARE 11 ACRES TO BE FILLED.

FINAL COVER PLACED ON 5 ACRES.

TWO MONITORING WELLS EXIST AT SITE.

			COST	COST/YD^3
I.	CLOSURE (10-MILE HAUL)		$ 495,000.00	$ 1.39
II.	POSTCLOSURE CARE (INCLUDES LEACHATE TREATMENT)		$ 1,502,000.00*	$ 4.21
III.	CONTINGENCY ACTION	CAPITAL	$ 1,481,000.00	$ 4.20
		OPERATION	$ 1,291,000.00*	$ 3.62
IV.	LINER/LEACHATE COLLECTION		$ 1,534,000.00	$ 4.30
V.	OPERATIONS (INCLUDES MONITORING, LEACHATE TREATMENT)		$ 1,619,760.00	$ 4.54
VI.	OTHER CAPITAL COSTS (INCLUDES HYDROGEOLOGIC STUDY)		$ 221,000.00	$ 0.62
			TOTAL TIPPING FEE	$23.00/$YD^3$

* POSTCLOSURE PERIOD OF 20 YEARS @ $75,100/YR
CONTINGENCY PERIOD OF 20 YEARS @ $64,500/YR

LANDFILL B ON A VOLUME BASIS WOULD REPRESENT LANDFILLS SUCH AS:

1. IRON RANGE
2. KORF BROTHERS
3. RED WING
4. KANABEC
5. NORTHWOODS

EXISTING LANDFILL C

ORIGINALLY 50 ACRE FILL ON 70 ACRE PARCEL.

THE SITE HAS BEEN OPERATING 10 YEARS AND HAS 20 YEARS (1,411,700 YD^3) OF REMAINING CAPACITY.

THERE ARE 35 ACRES TO BE FILLED.

FINAL COVER HAS BEEN PLACED ON 10 ACRES.

THREE MONITORING WELLS EXIST AT SITE.

		COST	COST/YD^3
I.	CLOSURE (10-MILE HAUL)	$ 1,307,000.00	$ 0.93
II.	POSTCLOSURE CARE (INCLUDES LEACHATE TREATMENT)	$ 3,856,000.00*	$ 2.73
III.	CONTINGENCY ACTION — CAPITAL	$ 1,481,000.00	$ 1.05
	CONTINGENCY ACTION — OPERATION	$ 1,291,000.00*	$ 0.92
IV.	LINER/LEACHATE COLLECTION	$ 5,639,000.00	$ 3.99
V.	OPERATIONS (INCLUDES MONITORING, LEACHATE TREATMENT)	$ 6,329,600.00	$ 4.48
VI.	OTHER CAPITAL COSTS (INCLUDES HYDROGEOLOGIC STUDY)	$ 257,000.00	$ 0.18
	TOTAL TIPPING FEE		$14.28/$YD^3$

* POSTCLOSURE PERIOD OF 20 YEARS @ $192,800/YR
CONTINGENCY PERIOD OF 20 YEARS @ $64,500/YR

LANDFILL C ON A VOLUME BASIS WOULD REPRESENT LANDFILLS SUCH AS:

1. POLK COUNTY
2. LINDENFELSER
3. GREATER MORRISON
4. BECKER COUNTY

EXISTING LANDFILL D

CAPACITY BASED ON CERTIFICATE OF NEED (CON).

HAS BEEN OPERATING 10 YEARS RECEIVES CON FOR 10 YEARS.

HAS FILLED 10 ACRES OF WHICH 5 ACRES HAS BEEN COVERED.

WILL FILL 10 MORE ACRES DURING CON PERIOD.

FILL CAPACITY FOR NEXT 10 YEARS EQUALS 242,000 CUBIC YARDS.

		COST	COST/YD^3
I.	CLOSURE (10-MILE HAUL)	$ 508,900.00	$ 2.10
II.	POSTCLOSURE CARE (INCLUDES LEACHATE TREATMENT)	$ 1,334,000.00*	$ 5.51
III.	CONTINGENCY ACTION — CAPITAL	$ 1,481,000.00	$ 6.12
	CONTINGENCY ACTION — OPERATION	$ 1,291,000.00*	$ 5.33
IV.	LINER/LEACHATE COLLECTION (10-MILES HAUL)	$ 1,169,000.00	$ 4.83
V.	OPERATIONS (INCLUDES MONITORING, LEACHATE TREATMENT)	$ 1,253,800.00	$ 5.18
VI.	OTHER CAPITAL COSTS (INCLUDES HYDROGEOLOGIC STUDY)	$ 203,400.00	$ 0.84
		TOTAL TIPPING FEE	$29.90/YD^3

* POSTCLOSURE CARE PERIOD OF 20 YEARS @ $66,700/YR
CONTINGENCY ACTION PERIOD OF 20 YEARS @ $64,500/YR

TD 788.4 .M6 R465 1990

Report to the Legislative
Commission on Waste