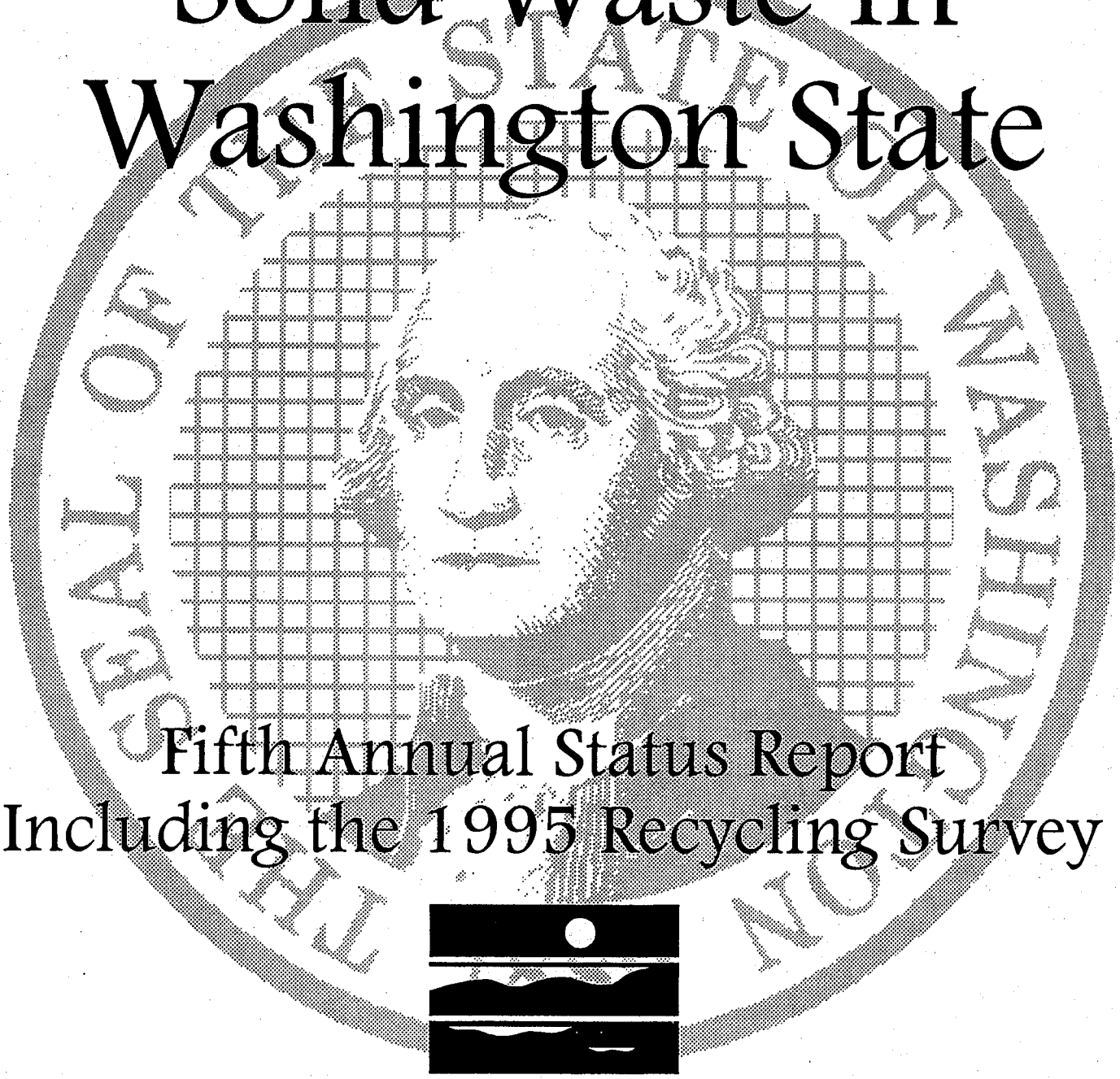
Solid Waste in Washington State



Fifth Annual Status Report Including the 1995 Recycling Survey

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Solid Waste and Financial Assistance Program
December 1996
Publication #96-505

Printed on Recycled Paper

Solid Waste in Washington State

Fifth Annual Status Report
Including the 1995 Recycling Survey

Prepared by:

Washington State Department of Ecology
Solid Waste and Financial Assistance Program

December 1996
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ACRONYMS

BOD	Biochemical Oxygen Demand
CDL	Construction, Demolition and Landclearing
CESQG	Conditionally Exempt Small Quantity Generator
CPG	Coordinated Prevention Grants
EPA	Environmental Protection Agency
ESHB	Engrossed Substitute House Bill
EYC	Ecology Youth Corps
GA	Department of General Administration
GOLD	Government Options to Landfill Disposal
HDPE	High-density polyethylene
HHW	Household Hazardous Waste
LDPE	Low-density polyethylene
MFS	Minimum Functional Standards
MRW	Moderate Risk Waste
MSW	Municipal Solid Waste
NPDES	National Pollutant Discharge Elimination System
PCS	Petroleum Contaminated Soils
PPG	Public Participation Grants
RA	Remedial Action
RCRA	Resource Recovery and Conservation Act
RCW	Revised Code of Washington
SQG	Small Quantity Generator
WAC	Washington Administrative Code
WR/R	Waste Reduction/Recycling

ACKNOWLEDGMENTS

Special thanks goes to the following Ecology staff for providing data and information for this fifth annual status report:

Headquarters

Marnie Black
Kyle Dorsey
Kip Eagles
Randy Martin
Dan Swenson
Iloba Odum
Terence Todd
Holly Wescott
Mariann Cook Andrews
Suzanne Crouch
Maggie Bell-McKinnon

Central Regional Office

Melissa Gildersleeve
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Eastern Regional Office

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Northwest Regional Office

John Keeling
Cullen Stephenson
Don Seeberger

Southwest Regional Office

Chris Chapman
Ethelwyn "Wyn" Hoffman
Paige Sorenson
Mikel Baxter

Special thanks also to Gloria Scott for data preparation, the cover and maps, and Judy Freeze for the graphics preparation and formatting.

The Solid Waste and Financial Assistance Program would also like to thank the many Recycling Coordinators in the counties who assisted with the preparation of the 1995 Recycling Survey.

EXECUTIVE SUMMARY

This Fifth Annual Status Report reports current information on solid waste facilities, looks at recycling and disposal trends for 1995, and discusses waste movement both within and out of the state. A review of solid waste management since the passage of the "Waste Not Washington Act" in 1989, is included. In addition, the 1995 Recycling Survey is included in this status report.

This annual report was compiled from report forms provided by solid waste landfills and incinerators, from surveys completed by recyclers and from information provided by Ecology's headquarters and regional staff in coordination with local jurisdictional health departments. The key findings of this fifth annual report follow.

SUMMARY OF FINDINGS

❖ Solid Waste Handling Infrastructure

In 1996, there are 311 solid waste facilities receiving permits statewide. These include landfills (76), intermediate transfer and storage facilities (225), and incinerators (5). There are five additional facilities classified as ancillary. There are additional facilities, most notably compost and moderate risk waste facilities, that are co-located at other permitted facilities. Biosolids land application sites are not included in the total.

In 1995, 24 municipal solid waste (MSW) landfills accepted waste, compared with 36 in 1994. Of these 24, 18 were publicly owned, 6 were privately owned. Seventeen of Washington's 39 counties have landfills, compared with 35 counties in 1991. One publicly owned landfill closed in May 1996. As MSW landfills continue to close, more counties will be relying on long-haul transport to facilities beyond their borders for disposal. In 1995, 33 of the 39 counties sent part of their waste by long-haul, with nine of those relying on a distant facility for all of their disposal needs.

Of the remaining non-MSW facilities in the landfill classification in 1996, there were 21 inert/demolition landfills, 18 limited purpose landfills, 13 woodwaste landfills and one ash monofill.

❖ Waste Reduction/Recycling

Ecology began evaluating methodologies that local government, business and institutions could use for measuring waste reduction.

In 1995, waste reduction, as well as recycling efforts, continued to focus on the priority waste stream of construction, demolition and landclearing (CDL) debris:

- The Western Washington CDL Recycling Coordinators Group was formed to promote waste reduction and recycling, and the use of recycled-content products in construction projects.

- An Environmental Building Resource Library was completed and provides information on building in a resource efficient or environmentally sustainable manner. This information is available at all Ecology regional offices.

A compost facility resource handbook is being developed to integrate the regulatory requirements, facility designs and best management practices for compost facilities.

The Ecology Youth Corps (EYC) picked-up over 156 tons of litter and recyclables on 1,838 miles of Washington highways and 456 acres during the summer sweep in July and August 1996. With 284 14-to-17 year-olds employed for the summer and another 62 during the school term, EYC remains one of the state's biggest youth employment programs.

Grants totaling $5 million, supported 56 local government waste reduction and recycling programs.

❖ 1995 Recycling Survey

In 1995, 2,576,523 tons of the recyclable portion of the solid waste stream were recycled. This represents a measured 39% recycling rate for the recyclable waste stream generated in 1995.

Although, this is still below the target goal of 50% recycling by 1995, the market has become more diverse and does not depend on just five or six materials as it did in the late 1980's.

In 1992, the state had six materials that were recycled at a rate over 40%. In 1995, eight materials were recycled at a rate over 40%. Eight more materials have seen dramatic increases in their recycling rates from 1992 to 1995[1]. This diversity should help the state increase its recycling rate in the coming years.

The survey changed methodologies this year and now only collects information on recyclables at the point of collection, rather than from the whole recycling infrastructure; collection, processing, brokerage, and end user. Part of the new methodology uses local recycling coordinators to check for double counting and

[1] See Table 5.1 in Chapter V.

non-response by local recycling businesses. The review process by local recycling coordinators has made the survey better and their contribution cannot be overstated.

❖ Disposal of Solid Waste

- **Municipal Solid Waste Landfills**

  In 1995, 4,001,815 tons of solid waste were disposed of in 24 MSW landfills. In 1994, a total of 3,878,615 tons was disposed of in 36 MSW landfills. Although the actual amount of waste increased, the per capita disposal rate actually decreased for the first time.

  In 1995, public landfills accepted 41% of the waste (compared to 69% in 1991); 59% was disposed in private landfills (compared to 31% in 1991). This shows the increasing trend for the use of private landfills.

- **Energy Recovery/Incineration**

  In 1995, 91% of the waste disposed in Washington was disposed in landfills and 9% was incinerated. A total of 397,588 tons of municipal solid waste was incinerated at five facilities. This is a slight decrease from the 421,626 tons incinerated in 1994. One incinerator ceased operation in May 1995. With no new incinerators planned, the amount of waste incinerated will likely remain stable.

  A total of 114,962 tons of ash produced by the MSW energy recovery facilities was disposed at the only permitted ash monofill in Washington at Roosevelt Regional Landfill in Klickitat County.

- **Solid Waste Importation/Exportation**

  In 1995, Washington's landfills and incinerators received 218,970 tons of waste from outside the state. This amounts to about 4% of the waste disposed in the state, compared with 2% in 1994. Washington exported 851,885 tons of waste to landfills in Oregon, an increase from 770,514 tons in 1994.

- **Remaining Capacity for Municipal Solid Waste Landfills**

  Of the 24 MSW landfills that received waste in 1995, one closed in May 1996.

  Self-reporting by the 23 MSW landfills that are operating in late 1996, indicated about 162 million tons of permitted capacity remained, or

approximately 41 years at the current disposal rate.[2] Of the remaining permitted capacity, 82% is at one facility, the Roosevelt Regional Landfill located in eastern Washington, in Klickitat County. The other capacity is at the other 22 landfills, most of which are operated to serve the citizens of the local area.

- **Other Solid Waste Landfills**

  In 1995, seven woodwaste landfills reported receiving 115,759 tons of waste, compared with 96,523 tons received at 11 facilities in 1994.

  In 1995, 13 inert/demolition landfills reported receiving 479,638 tons of waste, compared with 657,614 tons at 21 facilities in 1994. Increased recycling of CDL materials may account for much of the decrease in the amount of waste disposed. In addition, one major facility was repermitted in 1994 as a limited purpose landfill and the waste is now reported under that category.

  In 1995, 14 limited purpose landfills reported receiving 874,116 tons of waste, compared with 642,251 tons at 15 facilities in 1994.

- **Moderate Risk Waste**

  In 1995, 16.9 million pounds of Moderate Risk Waste (MRW) were collected in the state of Washington by 40 fixed MRW collection facilities and through 100 collection events held by the counties. This compares to 11.8 million pounds collected in 1994, a 43% increase. The biggest increases were in used oil collection and household hazardous waste.

  Within these MRW totals, 9.9 million pounds of used oil was collected from households at 477 used oil collection sites compared with 7.9 million pounds in 1994.

  Grants supported 39 household hazardous waste collection and disposal programs, including building or expanding of eight MRW collection facilities.

[2] Many factors can affect the amount of remaining capacity including population growth, the importing of waste from other states, and waste reduction and recycling activities.

CHAPTER I

SOLID WASTE MANAGEMENT IN WASHINGTON

In 1989, the Washington State Legislature passed the "Waste Not Washington Act." This provided new priorities and requirements for solid waste management. Conditions leading up to the passage of the act and how the state is succeeding in meeting the intent of the act are discussed below.

CONDITIONS LEADING TO THE "WASTE NOT WASHINGTON ACT"

Washington has been a national leader in solid waste management since the passage of the first *Solid Waste Management Act* in 1969 (chapter 70.95 RCW). This law has been amended as conditions have changed.

In the late 1980's, local landfill space became limited, with landfills closing because of increasingly strict standards for construction and performance. In 1985 there were almost 500 small local landfills statewide, with only 49 operating in 1990. It was becoming increasing difficult to site new landfills. Incineration was becoming an increasingly popular method of waste disposal being considered by many communities.

In 1987, the Legislature created the Joint Select Committee on Preferred Solid Waste Management. They were mandated to:

1. Evaluate preferred solid waste management systems;
2. Determine why higher rates of waste reduction and recycling had not been achieved; and
3. Report its finding to the Legislature.

CHAPTER 1 CONTENTS OF PAST ANNUAL STATUS REPORTS

The *First Annual Status Report* discussed key roles, responsibilities and activities of state and local governments for solid waste management, including state and local solid waste planning, waste collection, facility permitting, enforcement, and data collection.

The *Second Annual Status Report* detailed the roles of both state and local government in chapter 70.95 RCW, *the Solid Waste Management Act - Reduction and Recycling.*

The *Third Annual Status Report*, reviewed the statutory requirements and roles of both state and local government for moderate risk waste management, including a summary of the MRW planning process.

The *Fourth Annual Status Report* identified changes, as a result of funding reductions, in Ecology's activities related to solid waste.

(Please contact Ecology for past reports.)

The report of the committee was presented to the Legislature in 1988. The report found that:

- Incineration was increasing and projected to become a major method of disposal in the future.

- Integrated solid waste management systems, including a combination of waste reduction, recycling, incineration and landfills, were not being implemented in the state.

- Waste needed to be segregated in order to remove all recyclables from the waste stream, to eliminate non-combustible or toxic substances from incinerators and to eliminate biodegradable waste from landfill disposal,.

- Recycling had not become institutionalized.

- There was a misconception that recycling begins and ends with collection or separation of materials from the waste stream.

The report theorized that an ideal waste management system would have 50% recycling, 15% landfilling, and 35% incineration.

THE "WASTE NOT WASHINGTON ACT"

In the 1989, the Legislature passed the *"Waste Not Washington Act"* (ESHB 1671), which in part amended chapter 70.95 RCW. It established the following priorities for solid waste management:

1. Waste reduction.
2. Recycling, with source separation of recyclable materials as the preferred method.
3. Energy recovery, incineration or landfilling of separated wastes.
4. Energy recovery, incineration or landfilling of mixed wastes.

The Act also set a goal of recycling 50% of the state's waste by 1995.

Ecology was directed to develop a state solid waste management plan, study problem wastes, develop a waste characterization plan, develop statewide outreach campaigns to educate citizens about waste reduction and recycling, assist local governments in the development of revised local comprehensive solid waste management plans and other specific studies and activities.

Recycling opportunities were to be made available to citizens. To make this happen, local governments were required to prepare new local solid waste management plans to include waste reduction and recycling activities. Financial assistance was provided through grants to local governments to assist in the preparation and implementation of the local plans.

A process was set up which resulted in the formation of the Clean Washington Center to focus on markets for recyclable materials.

HOW HAS SOLID WASTE CHANGED SINCE THE PASSAGE OF THE "WASTE NOT WASHINGTON ACT"?

Recycling is Working and Available to Citizens

Under the "Waste Not Washington Act," counties were to revise their solid waste plans to include a waste reduction and recycling element. The Legislature recognized that not all counties would be able to meet these requirements at the same time. The larger, more urban counties were to complete their plans first, with smaller more rural counties later. Plans were to be completed on the following schedule:

Phase 1: July 1, 1991 (Spokane, Snohomish, King, Kitsap, Pierce counties)
Phase 2: July 1, 1992 (all other counties west of the crest of the Cascades)
Phase 3: July 1, 1994 (all counties east of the crest of the Cascades, except Spokane)

By 1996, all but four counties in the state had an updated Solid Waste Management Plan that meets the "Waste Not Washington Act" requirements and sets forth recycling and waste reduction goals. Three of the counties that do not have revised plans are within the Phase 3 planning area. All four counties are in the process of updating their plan to include the waste reduction and recycling requirements. Implementation of the plans in the Phase 1 and 2 counties is well underway with most of the Phase 3 counties beginning their implementation.

Over $25 million in grants funds were provided to local governments to update their solid waste management plans and to implement waste reduction and recycling. Through the implementation of the plans, recycling has become an integral part of most solid waste management systems in the state. In 1989, only six curbside program existed, available to about 13% of the state's population. By 1995, well over 100 curbside programs existed, available to about 75% of the population. Most of these programs are located in western Washington and the larger, eastside communities. Where curbside programs are not available, drop box, transfer station, landfill and incinerator site generally have recycling opportunities available, making recycling available to even more citizens.

The statewide goal of reaching 50% by 1995, was interpreted by Ecology to mean a combination of waste reduction and recycling which would reduce the waste going to disposal by 50%. Not all counties were expected to reach 50%, but were to set their own

recycling goals based on individual conditions and needs. (See Chapter V for information about each counties recycling goal.)

It was expected that larger, more urban counties would be able to exceed the 50% rate while smaller rural counties would be less likely to do so. Phase 1 counties were to implement their plans in 1992, Phase 3 counties were to start implementation by 1995. Differences in time available to implement programs, population bases, as well as accessibility to markets for recyclables, is reflected in the achieved 1995 recycling rates for the various Planning Phase regions:

Phase 1	43.5%
Phase 2	26.3%
Phase 3	14.5%

Although the state did not reach the 50% recycling goal by 1995, the recycling rate has steadily increased from 30% in 1989 to 39% in 1995. Several commodities are nearing or exceeding the 50% rate, indicating a broad base to the recycling rate, rather than a reliance on a few high rate commodities. Those commodities include:

Ferrous metals	74%	Newspapers	65%
Corrugated paper	62%	Yard Waste	49%
Aluminum cans	47%	High-grade paper	46%
Mixed-waste paper	46%	Non-ferrous metals	43%

Solid Waste We Generate is Changing

The types of waste going to solid waste landfills is changing. In the past, most of the waste disposed of in MSW landfills was generated from households. Part of that waste stream, about 1%, included moderate risk waste (MRW) which had potentially toxic effects on ground water when disposed in landfills and on air when incinerated. Efforts to remove MRW from the waste stream have included local planning efforts, educational efforts, collection events, and fixed handling facilities for MRW. Many of these efforts have been supported by grants to local governments, totaling almost $20 million. In 1995, almost 17 million pounds of MRW was collected by either 39 fixed MRW collection facilities or though 100 collection events held by counties.

Other wastes are increasingly being disposed in MSW landfills that in the past have gone to other types of landfills. Some of these include demolition debris, inert wastes, industrial wastes and cleanup wastes, such as petroleum contaminated soils and asbestos. Additional wastes resulting from modifications to the dangerous waste regulations in Washington are also now moving to the MSW landfills. MSW landfills are appropriate for the disposal of these types of materials, but they do take up capacity.

Waste not Recycled is Landfilled

At the time of the "Waste Not Washington Act," incineration seemed to be the trend in solid waste disposal. A projection of 35% incineration by 1995 has not occurred. In 1996, only five operating solid waste energy recovery facilities statewide accounted for nine percent of the waste disposed. There are no plans in the near future for either new facilities or major expansions.

Although not a direct result of the "Waste Not Washington Act," there are fewer, larger, better quality landfills in Washington. Of the 449 landfills in 1985, 150 of those accepted less than 100 tons of waste per day. In 1996, there are 23 municipal landfills, five of which accept less than 100 tons per day.

The large number of landfill closures was a result of changes in state regulations in 1985, and additional changes in federal and state regulations in 1991, that make design and operating procedures increasingly more complex and costly, but increase environmental protection. Over $12 million in grants to local governments have helped with the closure of 30 landfills from 1992 through 1995. (See Chapter VI for a more detailed discussion of disposal.)

Future Disposal of Waste Will Be Largely in Eastern Washington

Even with the closure of several landfills, the state of Washington still has an estimated 41 years of remaining permitted MSW landfill capacity. This amount is not evenly distributed however. Eighty-two percent (82%) of this remaining capacity is in the private Roosevelt Regional Landfill in Klickitat County in eastern Washington.

WHAT IS THE FUTURE OF SOLID WASTE IN WASHINGTON?

Waste Reduction and Recycling Need to Increase

The highest priority of waste management in the state is still waste reduction. In tracking recycling and disposal rates for the past few years, the per capita recycling rate has remained fairly stable, while the disposal rate has trended up slightly. In 1995, however, the per capita disposal rate fell from 0.95 to 0.93 tons per person per year. The significance of this decrease from one data point cannot be known for certain until the future trend is tracked. Logically, as the population continues to grow in Washington, so has the amount of waste disposed. The possible decline in per capita disposal may

indicate that waste reduction and recycling efforts are having effect. As recycling becomes even more institutionalized and waste reduction efforts increase, the disposed amount should continue to decrease.

Even though the 50% goal for 1995 was not met, state and local governments are still committed to increasing the recycling rate and diverting waste from disposal. While recycling from households has become a part of most local governments solid waste management systems, continuing the efforts, maintaining markets and expanding commodities will be the focus of many for the future. Continuation of support to local governments through grants will be necessary for some programs to continue.

There are different approaches possible to increase the recycling rate statewide. Continued evaluations, working with local governments and market developers will help guide future options for state and local governments to consider. Focus could be made in the Phase 2 and 3 counties to increase the collection of the traditional curbside commodities such as newspaper and mixed paper. (See Chapter V for a more detailed discussion.) Consolidation of materials to obtain sufficient quantities for transport to markets will be a key factor in the success of this approach. Another approach is to focus recycling efforts on new commodities and generators.

Increased recycling of industrial, commercial and special wastes such as contaminated soils, dredged spoils, vactor waste, tires, woodwaste, and construction and demolition debris is occurring. To increase recycling in these areas, some barriers may need to be addressed. For example, current laws and regulations treat these materials as identical to and subject to the same planning and numerical targets as household wastes. While the current regulation attempts to craft specific exclusions for recycling practices, practical application of these concepts has shown their inconstancies and shortcomings. An example is the unequal treatment of woodwastes during storage prior to reuse, the lack of specific standards for using inorganic waste on the land and the out-moded references to guidance documents for the use of land application of non-municipal sludges.

During 1996 and 1997, Ecology is evaluating the definition of solid waste in statute, which currently include recyclables, to determine if modifications could be made to move some of the recyclable materials out of the solid waste regulatory scheme. The issue of landspreading of materials for beneficial use is also being evaluated to determine if additional testing requirements should be required to determine if these practices are environmentally safe. The goal for Ecology is to redesign the regulatory system to focus on activities where environmental risks exist and to eliminate the addition of solid waste regulation in areas where no additional benefits or protection of the environment occur.

Adequate Disposal Options Need to be Maintained

Local governments have the responsibility of providing for the disposal of their solid waste. The result of fewer municipal solid waste landfills is that many cities and counties are no longer taking direct responsibility for the disposal of their solid waste. Instead,

contracts are made with distant landfills and the waste is long-hauled to them for disposal. Twelve of the 23 MSW landfills reported receiving waste from other counties in Washington. The large regional landfill in Klickitat County received some solid waste from 33 of the 39 counties. Nine of those 33 counties rely on that landfill for all of their disposal.

The closure of MSW landfills has also lead to exporting and importing solid waste. In 1995, 815,885 tons of solid waste were exported to Oregon landfills, while 218,970 tons of waste were imported to Washington landfills and incinerators. At this time Washington remains a net exporter of waste, however the amounts of imported waste have increase from the 67,000 tons originally reporting in 1991. (See Chapter VI for additional information.)

Changes in the Solid Waste Stream Need to be Managed

Changes in the state *Model Toxics Control Act* and in Federal and State hazardous waste regulations are changing the types of wastes that can be disposed of in MSW landfills. These changes are as follows:

- Some cleanup wastes that otherwise would qualify as "state-only" dangerous waste may be allowed to be disposed of in a solid waste landfill meeting the new standards of Chapter 173-351 WAC. These wastes would have to be the subject of a consent decree and their disposal or treatment approved by Ecology as protective of human health and the environment.

- In addition, the US Environmental Protection Agency is currently evaluating their definition of hazardous waste. It is very likely that in the coming years, some wastes formerly listed as hazardous will be "de-listed" and will be moved into the solid waste area. This includes contaminated media (soil or groundwater) associated with corrective action under hazardous waste regulations.

- Additional sources of waste for disposal in the solid waste infrastructure will result from the regulatory reform process for the state *Dangerous Waste Regulations*, chapter 173-303 WAC. This process evaluated dangerous wastes that are regulated at a level beyond the federal definition of hazardous wastes. For these "state-only" wastes it was determined that, because of the more stringent requirements of the new state/federal regulations for municipal solid waste landfills, and with the proper handling, these waste could be disposed of safely in MSW landfills.

While deregulating wastes because they pose a low level of risk as determined by the hazardous waste system, it is necessary to ensure that the solid waste infrastructure is in place and adequate to deal with the changes without potential harm to the environment or to human health. What has allowed much of the movement of waste from the hazardous to the solid waste system is the increased standards required at municipal solid waste

landfills under the new federal and state requirements which makes these types of landfills suitable for the safe disposal of these wastes.

The wastes, however, must be transported and handled, in some instances at solid waste transfer stations, prior to their arrival at the disposal facility. Adequate and safe handling and tracking through the transportation process needs to be ensured.

The state dangerous waste regulations were effective in January 1996. To date the "special wastes" have not posed a significant problem in terms of handling or disposal. The volume of materials appears to be relatively small. Future tracking of these materials received at MSW landfills will provide more information. The trend for moving waste from the hazardous to the solid waste arena will continue as the federal government reviews their classifications.

CHAPTER II

SOLID WASTE HANDLING INFRASTRUCTURE

This chapter describes the basic facilities, equipment and installations making up the solid waste management infrastructure within Washington state. While disposal and recycling information is from 1995, the lists of facilities are current as of July 1996.

Once solid waste is generated, its handling can be categorized into three distinct classifications that describe what can happen to it. Solid waste can either be: (1) landfilled; (2) intermediately handled - stored, transferred, processed; or, (3) incinerated. A fourth category, Ancillary-Other, explains anomalies to the three basic classifications of solid waste handling. For example, biosolids landspreading sites are not included in the total number of facilities. There is a new regulation proposed to deal exclusively with those types of sites.

Moderate risk waste is, by definition, excluded from regulation as dangerous waste, even though it may have the characteristics of dangerous waste. Moderate risk waste fixed facilities are regulated as interim solid waste handling sites.

Regulated solid waste facilities in the state are covered by three rules developed by Ecology. The first rule, chapter 173-304 WAC, *the Minimum Functional Standards* (MFS) identified 18 distinct solid waste facility types, each with its own set of permitting criteria. (Two of the 18 types identified in the MFS, sludge and septage utilization facilities, are in the process of being re-defined by federal criteria[3] and are being tracked separately from this annual status report.)

Table 2.1
State Solid Waste Infrastructure

CLASSIFICATION	STATEWIDE TOTAL	
	1995	1996
Landfill	84	76
Intermediate	222	225
Incineration	5	5
Ancillary - Others	4	5
Total Solid Waste Infrastructure	315	311

The second rule pertains to municipal solid waste landfills, chapter 173-351 WAC, *Criteria for Municipal Solid Waste Landfills.*

The third rule regulating solid waste handling facilities is chapter 173-306 WAC, *Special Incinerator Ash Management Standards*, which sets permitting, construction and operating standards for MSW incinerator ash monofills.

[3] Federal Criteria, once adopted in rule, will no longer consider sludge or septage as solid waste materials; they will be considered biosolids. Ecology's Solid Waste and Financial Assistance Program is responsible for state rule development.

In this report, Ecology has identified 300 solid waste handling facilities in Table 2.1. Facility ownership is categorized as either PUBLIC for those facilities owned by a recognized jurisdiction of government - a city, county or special purpose district - or as PRIVATE, for those facilities owned by corporations, partnerships or private individuals.

As an overview of the solid waste facilities in the state, Appendix A identifies the types and number of facilities and the county in which they are located. This table includes only those facilities that are separately permitted in chapter 173-304 WAC or chapter 173-351 WAC. Several other "facility types" exist but are co-located at another permitted facility. This is especially true for composting and MRW facilities. Future reports will identify all of the facility types, whether they are separately permitted or co-located with other facilities.

For a greater understanding of Washington's solid waste infrastructure, a closer examination of each solid waste infrastructure classification and applicable "type" sub-category follows.

LANDFILL CLASSIFICATION

The regulated permanent disposal of solid wastes in landfills in Washington occurs in five types of facilities: (1) ash monofills; (2) inert/demolition landfills; (3) limited purpose landfills; (4) municipal solid waste landfills; and (5) woodwaste landfills. (See Table 2.2.) A short discussion of each landfill classification "facility type" and its relationship to the state's overall infrastructure follows. A more detailed discussion of waste types and amount disposed and incinerated, movement of waste into and out of state, as well as trends in waste management, is found in Chapter VI.

Table 2.2
Landfill Classification

FACILITY TYPE	TOTAL # STATEWIDE		TOTAL BY OWNERSHIP DESIGNATION			
	Active	Active	Public		Private	
	1995	1996	1995	1996	1995	1996
Ash Monofill	1	1	0	0	1	1
Inert/ demolition	21	21	5	6	16	15
Limited Purpose	15	18	1	2	14	16
Municipal solid waste	36	23	29	17	7	6
Woodwaste	11	13	1	0	10	13
TOTAL	84	76	35	26	34	48

Ash Monofills

Ash monofills are landfill units that receive ash residue generated by municipal solid waste incinerator/energy-recovery facilities. The *Incinerator Ash Residue Act*, chapter 70.138 RCW, gave direct permitting authority to Ecology, as well as giving the department the authority to develop rules to regulate the disposal of this ash. Under chapter 173-306 WAC, *Special Incinerator Ash Management Standards*, incinerators

which burn more than 12 tons per day of municipal solid waste are required to have a Generator (Ash) Management Plan, approved by Ecology, in place prior to operation of a facility. The ash management plan identifies the location of ash monofills to be used for ash disposal.

In 1996, there was only one permitted ash monofill in Washington, located at the Roosevelt Regional Landfill in Klickitat County. The monofill operates under a permit issued by Ecology, and received 114,962 tons of special incinerator ash in 1995.

Inert/Demolition Waste Landfills

Inert/Demolition Waste landfills are facilities which receive "more than two thousand cubic yards of inert wastes and demolition wastes."[4] These facilities are regulated under WAC 173-304-461.

Table 2.3
Inert/Demolition Landfills

OWNERSHIP	TOTAL	
	1995	1996
Public	5	6
Private	16	15
TOTAL	21	21

Thirteen of the inert/demolition landfills that reported in 1995, took 479,638 tons of waste. Table 2.3 illustrates the profile of inert/demolition facilities statewide over the past two years. Most (71%) of the inert/demolition landfills are privately owned and operated. Public inert/ demolition landfills make up 29% of this facility type.

Limited Purpose Waste Landfills

Limited purpose landfills are facilities that receive "solid wastes of limited types, known and consistent composition, other than woodwastes, garbage, inert waste and demolition waste."[5] These facilities are regulated under WAC 173-304-460(5). Limited purpose landfills are identified by the type of waste. In other words, the waste associated with a limited purpose landfill is unique to that facility.

Fourteen limited purpose landfills that reported in 1995, accepted 874,116 tons of waste. Table 2.4 illustrates the 1996 profile of limited purpose facilities statewide. All but two of the regulated limited purpose landfills are private. The waste disposed in these facilities is usually generated by the owner of the

Table 2.4
Limited Purpose Landfill

OWNERSHIP	TOTAL	
	1995	1996
Public	1	2
Private	15	16
TOTAL	16	18

[4] WAC 173-304-461(1)

[5] WAC 173-304-100(98)

landfill.

Municipal Solid Waste Landfills

Chapter 173-351 WAC, *Criteria for Municipal Solid Waste Landfills*, effective November 1993, incorporated the new federal Subtitle D rules. It was the first major revision of landfill regulations since 1985. The new rule strengthens engineering, siting, operational, closure/post-closure and ground water monitoring standards for existing and new municipal solid waste landfills. It set a deadline of October 9, 1994, for existing landfills to close or be subject to the new rules. The new standards also address the need for corrective action financial assurance for landfills that may fall under cleanup requirements of federal and state Superfund laws.

Table 2.5
Municipal Solid Waste Landfills

OWNERSHIP	TOTAL	
	1995	1996
Public	18	17*
Private	7	6
TOTAL	24	23

* One publicly owned MSW landfill closed May 1996

In 1995, 24 MSW landfills accepted 4,001,815 tons of waste. (See Chapter VI for additional discussion of waste types, amounts and sources.) Table 2.5 identifies the statewide infra-structure profile for 1995 and 1996.

The majority, 74%, of MSW landfills are operated by public entities. This has historically been true in Washington. Private MSW landfills constitute only 26% of this facility type. Even though most of the landfills are owned by public entities, the majority of landfill capacity (85%) is under the control of the private sector. (See the discussion on landfill capacity, in Chapter VI.)

Woodwaste Landfills

Woodwaste landfills are those facilities which landfill "more than 2,000 cubic yards of woodwaste, including facilities that use woodwaste as a component of fill."[6] These facilities are regulated under WAC 173-304-462.

Table 2.6
Woodwaste Landfills

OWNERSHIP	TOTAL	
	1995	1996
Public	1	0
Private	10	13
TOTAL	11	13

The MFS defines woodwaste as "solid waste consisting of wood pieces or particles generated as a by-product or waste from the manufacturing of wood products, handling and storage of raw materials and trees and stumps. This includes, but is not limited to, sawdust, chips, shavings, bark, pulp, hog fuel, and log sort yard waste, but does not

[6] WAC 173-304-462(1)

include wood pieces or particles containing chemical preservatives such as creosote, pentachlorophenol, or copper-chrome-arsenate."[7]

Seven of the woodwaste landfills that reported in 1995, accepted 115,759 tons of waste. All woodwaste landfills are privately owned.

INTERMEDIATE CLASSIFICATION

Solid waste, prior to its final disposal or incineration, is often accumulated at a storage facility, consolidated at a transfer station, converted into a useful product, or prepared for recycling or disposal at a processing center. The storage, transfer or processing of solid wastes are regulated by the MFS and fall under the interim[8] or intermediate classification of solid waste handling facilities. Some moderate risk waste fixed facilities are regulated as interim solid waste handling sites.

Specifically, a storage facility primarily holds "solid waste materials for a temporary period"[9] while a processing center is in the operation of converting "solid waste into a useful product or to prepare it for disposal."[10] A transfer station, on the other hand, is a "permanent, fixed, supplemental collection and transportation facility, used by persons and route collection vehicles to deposit collected solid waste from off-site into a larger transfer vehicle for transport to a solid waste handling facility."[11]

The distinguishing characteristic of all interim or intermediate classification solid waste handling facilities is that they are not designed for final disposal. There are 10 types of intermediate facilities: (1) baling stations; (2) compacting stations; (3) composting facilities; (4) drop boxes; (5) moderate risk waste fixed facilities; (6) piles; (7) recycling centers; (8) surface impoundments; (9) transfer stations; and (10) tire piles.

Bale Station

A bale station is a facility that processes loose solid waste into large bound bundles. The purpose of binding waste in this fashion is to place the bundles into lifts at a landfill. These facilities are regulated under WAC 173-304-410. Because this technology is often confused with compacting stations, and since bale stations are regulated under the same section of the MFS, to date no bale stations have been permitted as separate facilities. One county does have a bale station located at its transfer station but it does not have a separate permit.

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[7] WAC 173-304-100(91)

[8] WAC 173-304-100(38)

[9] WAC 173-304-100(76)

[10] WAC 173-304-100(62)

[11] WAC 173-304-100(82)

Compacting Station

A compacting station is a facility which employs mechanical compactors to compress solid wastes into dense packets of material for shipment. These facilities are regulated under WAC 173-304-410.

Ecology identified seven compacting stations statewide in 1996. All compacting facilities are under public ownership and are affiliated with recycling operations. Compacting stations are located in the more urban, northwestern counties of the state. Larger urban centers are more inclined to use this technology to process large amounts of recyclables for shipment. Compactors are also used at transfer stations, though they are not permitted separately.

Compost Facilities

A compost facility is a facility which promotes the biological decomposition of organic solid waste, and other organic material, yielding a product for use as a soil conditioner. Composting is considered a key element of the state's strategy of reaching the statewide 50% recycling goal.

The MFS regulates compost facilities under the non-containerized solid waste standards for recycling facilities in WAC 173-304-300 (1)(a)(i) and under WAC 173-304-420, depending upon the "condition specific" nature of the waste e.g., whether or not the waste produces, or has the potential to produce, leachate. Twenty-seven compost facilities permitted under the MFS were identified in 1996.

Table 2.7
Compost Facilities

OWNERSHIP	TOTAL	
	1995	1996
Public	7	10
Private	11	17
TOTAL	18	27

Ecology is developing a resource handbook for compost facilities. This handbook will address facility designs and operating procedures to protect human health and the environment. (See Chapter IV for additional discussion.)

Ecology issued *Interim Guidelines for Compost Quality*[12] in April 1994 and revised them in November 1994. The guidelines focus on the finished compost product. One of the primary objectives of these guidelines was to promote consumer acceptance of composted products by creating statewide standards and enhanced consumer confidence in the safety of these products.

[12] *Interim Guidelines for Compost Quality*. Solid Waste Services Program. Department of Ecology. Publication #94-38. April 1994.

Drop Boxes

A drop box is defined in the MFS as "a facility used for the placement of a detachable container including the area adjacent for necessary entrance and exit roads, unloading and turn-around areas."[13] It is regulated under WAC 173-304-410.

Table 2.8
Drop Boxes

OWNERSHIP	TOTAL	
	1995	1996
Public	61	62
Private	4	9
TOTAL	65	71

Drop boxes normally serve the general public by receiving loose loads of waste that are transported to the site by an individual for later disposal or recycling. Typically drop boxes for household waste are located in the more rural areas of the state.

Ecology identified 71 operating drop boxes in 1996. Table 2.8 depicts the profile of regulated drop boxes statewide. The majority, over 87%, are public and are primarily operated by county public works departments.

Piles

A solid waste pile is described in the MFS as any "noncontainerized accumulation of solid waste that is used for treatment or storage."[14] Pile storage/treatment areas are usually associated with the storage and processing of wastes requiring remedial actions, such as petroleum-contaminated soils. Pile facilities or areas used for storage and treatment are regulated by WAC 173-304-420. (Compost facilities can also be regulated under this section as discussed above.) Five privately owned piles (non-composting) were identified in 1996.

Recycling Facilities

A regulated recycling facility refers to an operation engaged in the collection and utilization of solid waste for the purpose of transforming or remanufacturing the waste materials into usable or marketable materials for use other than landfill disposal or incineration. Chapter 70.95 RCW, the *Solid Waste Management Act* refers to "recyclable materials" as "those solid wastes that are separated for recycling or reuse, such as papers, metals, and glass, that are identified as recyclable material pursuant to a local comprehensive solid waste plan."[15] Recycling facilities are regulated under WAC 173-304-300.

It is important to note that many types of recycling facilities are not regulated by the MFS. For example, the regulations do not apply to single family residences and single

[13] WAC 173-304-100(25)

[14] WAC 173-304-100(56)

[15] RCW 70.95.030(14)

family farms engaged in composting of their own wastes (exempt from any other regulations); facilities engaged in the recycling of solid waste containing garbage, such as garbage composting; facilities engaged in the storage of tires; problem wastes; facilities engaged in recycling solid waste stored in surface impoundments, which are otherwise regulated in the MFS (WAC 173-304-400); woodwaste or hog fuel piles to be used as fuel or raw materials stored temporarily in piles being actively used; nor do they apply to any facility that recycles or uses solid wastes in containers, tanks, vessels, or in any enclosed building, including buy-back recycling centers. Composting and land application of materials are regulated under other portions of chapter 173-304 WAC.

Because of the distinction between regulated recycling facilities and non-regulated activities that promote recycling, only 15 recycling facilities permitted under the MFS requirements were identified in 1996. The majority (80%) of the regulated recycling facilities were private facilities and public recycling facilities constituted 20% of this facility type.

Surface Impoundments

A surface impoundment refers to "a facility or part of a facility which is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials), and which is designed to hold an accumulation of liquids or sludges. The term includes holding, storage, settling, and aeration pits, ponds, or lagoons, but does not include injection wells."[16]

Some surface impoundments are regulated under WAC 173-304-430.[17] Ecology identified four regulated facilities in 1996. All four of these surface impoundment facilities were septage lagoons. The category remains in the intermediate classification pending interpretation or clarification in the forthcoming biosolids rule. The majority of the regulated surface impoundment facilities were publicly-owned, and one is privately-owned.

Transfer Stations

A transfer station is defined as "permanent, fixed, supplemental collection and transportation facility, used by persons and route collection vehicles to deposit collected solid waste from off-site into a larger transfer vehicle for transport to a solid waste handling facility."[18] The regulations applicable to transfer stations are contained in WAC 173-304-410.

[16] WAC 173-304-100(80)

[17] Surface impoundment facilities permitted under federal, state or local water pollution control laws are excluded from regulation under WAC 173-304-430.

[18] WAC 173-304-100(82)

Typically, transfer stations are areas where individual collection vehicles can be off-loaded, the waste stored for a short period of time and reloaded onto larger vehicles for transfer to the disposal facility.

In the past, transfer stations were generally located in larger, urban areas; however, with the new federal regulations applicable to municipal solid waste landfills, jurisdictions are now viewing transfer stations as an option to operating a landfill. Wastes can be collected at these centers for long-hauling to regional MSW landfills.

Table 2.9
Transfer Stations

OWNERSHIP	TOTAL	
	1995	1996
Public	44	52
Private	23	26
TOTAL	67	78

Transfer stations often have areas where the public can bring waste for disposal. Many also have recycling facilities and/or household hazardous waste collection areas. There were 78 regulated transfer stations operating in 1996.

The profile (Table 2.9) shows that the majority of the transfer stations continue to be publicly operated entities, 66%.

Moderate Risk Waste Facilities

Moderate risk waste is, by definition, excluded from regulation as dangerous waste, even though it has the characteristic of dangerous waste. Moderate risk waste fixed facilities are regulated as interim solid waste handling sites. Some of these facilities are co-located at other types of permitted facilities, such as transfer stations and landfills, and do not receive a separate permit.

MRW facilities vary in the types and number of materials they can handle. Some received only limited types of materials, such as used motor oil, batteries and oil-based paints, while others can collect several types of waste including those generated by small quantity generators. In 1996, Ecology had 17 MRW fixed facilities in its tracking system that received a separate permit. (See Chapter VI for additional information about MRW.)

Fixed facilities typically have a hazardous management plan pursuant to article 80 of the *Uniform Fire Code*, as well as a solid waste handling permit issued by the jurisdictional health district. There are currently over three dozen fixed facilities in Washington, with 15 more in the planning or design stages.

Generally, used oil collection facilities are not required to have solid waste handling permits in accordance with the MRW Fixed Facility Guidelines[19], but often have a permit from the local fire department. There were 477 used oil collection facilities in the state at the end of 1995.

[19] *Moderate Risk Waste Fixed Facility Guidelines*. Department of Ecology. Publication No. 92-13. March 1992 (revised May 1993).

Household hazardous waste collection events require no permit under state law. However, Ecology has provided guidelines[20] which are widely used.

Despite the large volumes of hazardous waste now entering the moderate risk waste collection and management system, there have been no major releases to the environment to date at any facility or event. (See Chapter VI for additional discussion of materials collected.)

Tire Piles

In Washington state, about four million used tires are generated each year. The used tires may be taken to tire pile storage facilities. A regulated tire pile facility in Washington is any tire pile that temporarily stores or accumulates more than 800 tires. Tire pile standards are contained in WAC 173-304-420.

A major problem with used tires has been illegal tire piles. This section, however, deals specifically with regulated tire piles. (See Chapter III for additional information about the cleanup of illegal tire piles.) Ecology identified one permitted tire pile in the state in 1996, privately owned.

INCINERATION CLASSIFICATION

An energy recovery facility is considered a combustion plant which specializes in the "recovery of energy in a useable form from mass burning or refuse-derived fuel incineration, pyrolysis or any other means of using the heat of combustion of solid waste that involves high temperature (above twelve hundred degrees Fahrenheit) processing."[21] By definition, incineration as it applies to solid waste materials, means "reducing the volume of solid wastes by use of an enclosed device using controlled flame combustion."[22]

Energy recovery and incinerator facilities are regulated under WAC 173-304-440 applies to "all facilities designed to burn more than twelve tons of solid waste per day, except for facilities burning woodwaste or gases recovered at a landfill."[23]

Table 2.10
Incinerator Classification

OWNERSHIP	TOTAL	
	1995	1996
Public	2	2
Private	3	3
TOTAL	5	5

Ecology identified five regulated solid waste

[20] *Household Hazardous Waste Guidelines for Conducting Collection Events*. Department of Ecology. Publication #88-6. February 1989.

[21] WAC 173-304-100(26)

[22] WAC 273-304-100(37)

[23] WAC 173-304-440(1)

incinerator facilities that burned a total of 397,588 tons of waste. One of the incinerators, Inland Empire Paper in Spokane, falls under the *Minimum Functional Standards* as a solid waste incinerator because they burn more than 12 tons of solid waste per day. At this facility, the waste is composed of the paper sludge from the pulp and papermaking process. The other four incinerators burn municipal solid waste.

In addition to solid waste handling permit requirements under the MFS, solid waste incinerators may be subject to regulations under chapter 70.138 RCW, the *Incinerator Ash Residue Act*. The rules implementing this, chapter 173-306 WAC, *Special Incinerator Ash Management Standards*, require certain solid waste incinerators to prepare generator (ash) management plans. These rules do not apply to the operation of incineration or energy recovery facilities that burn only tires, woodwaste, infectious waste, sewage sludge or any other single type of refuse, other than municipal solid waste. They also do not apply to facilities which burn less than 12 tons of municipal solid waste per day

Of the five solid waste incinerators operating during 1996, four of these facilities are subject to both the requirements of chapter 173-304 WAC and chapter 173-306 WAC. These four facilities are required to have a generator ash management plan, approved by Ecology, which discusses the handling, storage, transportation and disposal of the incinerator ash. All four facilities, three public and one private, have approved generator ash management plans and solid waste handling permits.[24]

ANCILLARY - OTHER CLASSIFICATION

The classification of Ancillary - Other, is not covered or spelled out in regulation but is included here to explain certain anomalies discovered in the reporting process that may have an effect in subsequent reporting years. To qualify for inclusion in this category, a facility type must be either under regulatory modification, be exempted from regulation, or determined to be an obscure facility type needing reclassification or elimination outright. This classification includes: (1) Biosolids; (2) Exempted-Tribal Facilities; (3) Landspreading; and (4) Other.

Biosolids Regulation Development

In 1992, the Legislature passed ESHB 2640, an *Act Relating to Municipal Sewage Sludge*. The new chapter 70.95J RCW, *Municipal Sewage Sludge - Biosolids*, defines biosolids as "municipal sewage sludge that is primarily organic, semisolid product resulting from the waste water treatment process, that can be beneficially recycled and meets all requirements under this chapter. Biosolids includes septic tank sludge, also known as septage, that can be beneficially recycled and can meet all requirements of

[24] One of the public municipal solid waste incinerators ceased operations in May 1994.

chapter 70.95J RCW." Chapter 70.95J RCW contains provisions for the development of a new biosolids management program by Ecology.

Ecology has been developing Chapter 173-308 WAC, *Biosolids Recycling*, but has determined that it is not in the best interests of the regulated community to move forward with a formal rule proposal unless there are adequate funds to support the new program and meet the needs of the regulated community. Current funding for biosolids related activities will expire on June 30, 1997. Completing the rule and implementing the biosolids program is dependent upon support from the regulated community working with the Legislature to provide continued funding.

If adequate funding is provided, Ecology expects to propose a final rule by mid-1997. The rule development process to date has included one round of public workshops. A revised draft of the rule will be released in 1996 along with a responsiveness summary based on the first series of workshops. Additional public workshops are not planned, but may be convened based on need and available funding. Formal public hearings will be held prior to rule adoption if there is adequate funding to carry the rule forward.

Municipal sewage sludge and septage are presently classified as solid wastes under chapter 70.95 RCW, the *Solid Waste Management Act*, and chapter 173-304 WAC, the *Minimum Functional Standards*. The new regulation will create standards for municipal sewage sludge and domestic septage which allow each to be classified as biosolids. Biosolids will not be solid waste, and will be regulated under chapter 70.95J RCW and chapter 173-308 WAC. Ecology will have primacy in permitting the final use of biosolids, but will be able to delegate authority to local jurisdictional health departments on request.

Exempted Facilities

Exempted facilities, for the purpose of this report, are those solid waste handling facility types that are identified under Washington statute or rule but are either (1) not under the jurisdiction of state or local governments, such as Tribal solid waste facilities; or (2) are exempted for consideration by other federal, state or local laws, such as woodwaste facilities which fall under Department of Natural Resources rules. One such facility was identified in 1996.

Landspreading Disposal Facilities

A landspreading disposal facility under the MFS is a facility that applies sludges or other solid wastes onto or incorporates solid waste into the soil surface at greater than agronomic rates and soil conditioners/immobilization rates. Landspreading disposal facilities are regulated under WAC 173-304-450. One sludge and one septage facility were identified in this category in 1996. (Many sites using biosolids for land application will be permitted under the new biosolids regulation discussed above.)

Other Facilities

The "other" category of facility types is an actual category of the MFS and applies to "other methods of solid waste handling such as a material resource recovery system for municipal waste not specifically" identified elsewhere in the MFS. The specific regulations for "other" facilities are in WAC 173-304-470. This type of facility is basically a miscellaneous category which is designed to cover new solid waste technologies that are developed between MFS revisions. The incinerator at Friday Harbor has been included under this category because it does not meet the MFS definition of an incinerator. One other permit was issued in this category, to a medical waste recycling facility.

OPERATOR CERTIFICATION PROGRAM

In Washington state, solid waste landfills and incinerators are required to have certified operators on site at all times, per chapter 70.95D RCW, *Solid Waste Incinerator and Landfill Operators*. The Landfill and Incinerator Operator Certification program was created by the legislature in 1989, through the "Waste Not Washington Act". The implementation rule was adopted in June 1991, chapter 173-300 WAC, *Certification of Operators of Solid Waste Incinerators and Landfill Facilities*. Course offerings began in 1992, with those taking the course and passing the test receiving certifications of competency for 3 years.

Yearly training courses were held on landfill and incinerator operations until 1995. At that time, direct funding for implementing this program at Ecology was not available. Because of reduced staffing, a home study course was instituted. This not only reduced the level of effort for Ecology, it provided a cost savings to those who took the course. The certification training however no longer focuses on Washington specific issues for both operators and inspectors.

The requirements for having certified operators on site at all times apply to the following types of facilities: municipal solid waste landfills; inert and demolition landfills; limited and special purpose landfills; and all incinerators that burn solid waste. It must be noted that the law also requires that any person inspecting an applicable solid waste facility must be certified.

Over 900 persons have taken one or both courses since the programs inception. To date, a total of 510 people have been certified for landfill operations and 310 have been certified for incinerator operations. Certification renewals began in 1994. As of June, 240 persons have been recertified as landfill operators, while 146 have been recertified as incinerator operators. Certificates are renewed without any additional training because of the lack of funding to fully implement the program.

There has been a significant decrease in the number of persons taking the landfill course since 1995. The reduction in the number of certified landfill operators can be attributed to a reduction in the number of landfills since the program began. The number of persons taking the incinerator course has stayed fairly stable.

CHAPTER III

IMPLEMENTING SOLID WASTE ACTIVITIES

In addition to regulation and technical assistance, Ecology helps to ensure proper solid waste management through financial assistance in grants and contracts. Ecology helps local governments fulfill their role as waste managers by providing financial assistance in the form of grants. These grants cover some of the costs of planning for slid and moderate risk waste management, putting those plans into action, and enforcing regulations.

Ecology also provides small grants to citizen groups to help implement the state's goal of pollution prevention and waste reduction.

In certain cases, Ecology contracts with private business to accomplish specific solid waste actions. This has occurred most recently in the case of tire pile cleanups.

GRANTS TO LOCAL GOVERNMENTS

The grant programs fund local government activities including:

- inspecting facilities and pursuing illegal disposal
- collecting and disposing of household hazardous waste
- working with businesses to find ways to reduce and recycle their moderate risk waste
- teaching people how to prevent waste and to recycle
- providing curbside and drop box collection for recyclables
- providing yard waste composting
- drilling ground water monitoring wells at active landfills
- training staff
- special projects, such as demonstration projects

Ecology awarded $17,935,411 in grants for waste management from July 1, 1995 through June 30, 1996. The grants leveraged local matching funds to support $28,266,609 worth of solid and moderate risk waste projects. An additional $310,243 in grant amendments went to existing grants. Ecology also supports efforts to clean up contaminated sites through the remedial action grants program, which awarded over $12.1 million from July 1, 1995 through June 30, 1996. [25]

[25] See also "Model Toxics Control Act 1996 Annual Report" (#96-601A) regarding grants provided to local governments and citizen groups for cleanups at contaminated sites.

Coordinated Prevention Grants (CPG)

Most of the solid and moderate risk waste projects supported by grants are funded through the Coordinated Prevention Grants program. Ecology launched this consolidated program of grants for waste management in 1992. It reduces the oversight needed to administer the programs and combines funds from the three available resources, the Local Toxics Control Account, and the Referenda 26 and 39 accounts. Since 1992, local governments have received over $68 million for solid and moderate risk waste activities, waste reduction and recycling activities and facilities, and landfill closures. $18.2 million of this total is for the current 96/97 funding cycle.

The coordinated structure encourages local governments to work together to examine their waste management needs and decide the activities they will propose for grant funding. Ecology allocates the available funds for county-wide areas, using a formula based on a set amount per county plus a certain amount per capita. For the 1996-97 grant cycle, this amounted to $100,000 per county, plus $2.04 per capita. Local governments also have available, from the Referenda 26 and 39 accounts, a one-time allocation of $125,000 per county plus $1.50 per capita.

Grant recipients must provide a cash match of at least 25 to 40 percent of the total eligible costs of their projects. The lower match amount is available to counties with high unemployment and low per capita income.

In most cases cities and counties are doing a good job of working together to assess their needs and apply for funding for the projects that best meet those needs. Some cities have individual grant agreements although their approach to waste management challenges is coordinated with the county government.

The Cowlitz County/Longview/Kelso Example

In Cowlitz County, for example, the Department of Public Works, the Health Department, and the cities of Kelso and Longview, will receive $509,223 in grant funding during 1996 and 1997. The grants will be matched with $226,312 in local dollars. The four jurisdictions will use the grant funding to:

- Build a yard waste composting site open to all county residents
- Collect and dispose of household hazardous waste from the county's fixed facility and mobile collection events
- Maintain the used oil and antifreeze drop-off site
- Educate the public about household hazardous waste and promote the use of less toxic products and safe disposal
- Help businesses that generate small quantities of hazardous waste to properly dispose of the waste and to reduce, recycle, and use less toxic alternatives
- Produce a county-wide recycling directory

- Provide educational materials for schools and participate in local events with the Master Recyclers/Composters program
- Inspect solid waste facilities to make sure they are operating correctly
- Respond to reports of illegal solid waste handling and disposal
- Review applications and plans for solid waste facilities, and issue and renew permits
- Continue the promotional campaign in Longview to increase participation in the city's curbside collection program
- Provide Longview residents with backyard composting bins at a reduced price
- Continue the public outreach campaign in Kelso to promote recycling and waste reduction and to increase use of the city's drop box recycling sites
- Buy two additional drop box recycling containers for Kelso's program

During January through March 1996, the jurisdictions reported they had already:

- Diverted from the household waste stream a total of 6,936 gallons of used oil, 375 gallons of antifreeze, and 8,787 pounds of oil-base paint and other flammable liquids
- Collected 1,456 units of hazardous waste from businesses and consolidated the waste for cost-effective disposal
- Answered 98 inquiries from households and businesses about hazardous waste
- Distributed 306 household hazardous waste information packets
- Inspected 6 open and 2 closed facilities
- Renewed 13 existing permits, reviewed 4 new permits, and processed 2 new permits
- Responded to 81 complaints, made 65 violation contacts, achieved compliance at 19 illegal sites, worked on compliance at 8 sites, and referred 2 sites to the county prosecutor
- Made 239 solid waste enforcement consultation contacts with members of the public
- Distributed 1,078 backyard composting bins in Longview
- Increased recycling in Longview by almost 7 percent (January through May 1996), collecting over 976 tons of recyclable material
- Collected over 323 tons of recyclable material in Kelso
- Each month, aired up to 80 radio "spots" promoting recycling in Kelso

Capital Investment in Waste Reduction and Recycling

Capital purchases for waste reduction and recycling equipment and facilities continued this last year as more local governments finished the waste reduction and recycling updates to their solid waste management plans. From July 1995 through June 1996, 23 local governments signed agreements to build or expand collection and processing facilities, purchase balers, tub grinders, used oil collection tanks and other equipment, and provide drop boxes and recycling bins for their residents. This is in addition to the projects already underway throughout the state.

These capital investments for waste reduction and recycling are funded through the Referenda 26 and 39 accounts. The program is using up funds left from voter-approved

bond issues in the late 1970s and early 1980s that originally established the accounts. Ecology set aside this remaining money as local government allocations, which are available through the Coordinated Prevention Grants program until the end of 1997.

In the 96/97 funding cycle, $3.5 million has been provided to local governments for purchasing capital equipment for recycling and moderate risk waste activities.

Landfill Closures

The landfill closure program element of the Coordinated Prevention Grants program ended in December, 1995. From July through December 1995, one county used a grant to close a municipal solid waste landfill in accordance with state environmental standards. Properly closing landfills prevents future contamination, but it is also costly, especially for local governments with old landfills that are no longer bringing in tipping fees. Active landfills are required to have funds set aside for closure and post-closure monitoring. In the four years that the closure grants were offered, 30 landfills were closed with the assistance of $12.6 million in grant funds.

GRANTS TO CITIZENS

Public Participation Grants (PPG)

Ecology also provides small grants to citizen groups whose projects help implement the state's priorities of waste reduction and recycling. The Model Toxics Control Act mandates this Public Participation Grants (PPG) program. It is highly competitive and creates great interest in a wide variety of citizen groups and not-for-profit organizations interested in these issues. All projects must include an education element directed at an audience beyond the group's members.

From July 1995 through June 1996, Ecology awarded 21 of these Public Participation Grants, for a total of $469,900. They covered a wide range of approaches to preventing and recycling waste, including educating citizens around cleanup sites. A couple of specific examples of waste reduction and recycling efforts include:

> The **Economic Development Association** of Skagit County is using a $35,000 grant to demonstrate for businesses the environmental and bottom line benefits of waste reduction and recycling. The Association is holding workshops, creating an Environmental Industries Home Page on the Internet, and reaching out to targeted decision makers in the local business community. Fisher and Sons Construction company reported that the company saved $639 in wood waste disposal costs at just one job site and diverted 13 tons of wood scraps from the landfill by using simple recycling practices learned through the Association's project.

Sound Decisions, a non-profit group in Olympia, is using a $24,628 grant for an educational program on the connection between individual behavior, waste management practices, and water quality. The program includes an interactive play, workshops, and a simulated complex, multi-party waste management conflict. Sound Decisions anticipates reaching 3,000 high school students and visitors to state parks with the program. The group worked with Ecology, Washington State Parks, the non-profit Rivers Council of Washington, and Northwest Naturals, a local fish processor, to inventory local waste management problems and to develop the educational program.

REVIEW OF THE COORDINATED PREVENTION GRANTS PROGRAM

In 1996, the Solid Waste and Financial Assistance Program began a review of the Coordinated Prevention Grants program. Since 1992, local governments have received over $68 million in grants for solid and moderate risk waste activities, waste reduction and recycling activities and facilities, and landfill closures. Since the start of the CPG program, many changes have occurred in solid waste:

- All but four counties have completed their local solid waste management plans. All counties have completed their moderate risk waste planning.
- Over 100 curbside recycling programs are available to 75% of the state's population.
- A statewide recycling rate of 39% was reached in 1995.
- Moderate risk waste collection and disposal is available in most of the state through a network of fixed facilities and household collection events.
- Thirty non-complying landfills were closed using grant funds.

Program staff have been working with State Solid Waste Advisory Committee to review how grant funds have been spent over the past grant cycles and evaluating where the need remains. Possible changes in the program, including activities that are eligible for grant funding and changes in how grants are awarded are being reviewed.

Proposed changes to the CPG grant program, if any, will be sent out for public review and comment in January 1997. Draft CPG Guidelines for the FY98/99 cycle will be issued for review in late spring 1997. The application period for new CPG grants will begin in summer 1997, with grants being awarded for January 1998.

CONTRACTS TO THE PRIVATE SECTOR

Tire Pile Cleanup Contracts

The legislature established a one-dollar-per-tire fee on the retail sale of new vehicle tires. in 1989. The funding source was to be used to clean up existing unauthorized tire piles around the state. The fee sunset in October 1994. Ecology, in conjunction with local jurisdictional health departments, created a prioritized cleanup list containing 25 sites located in seven counties.

The first cleanup contracts were executed in May 1991. By the end of 1995 Ecology had completed the cleanups of all 25 originally identified sites. During the process of cleaning up the original 25 piles, the cost per site decreased and funds remained for additional tire pile cleanups.

The 1996 Legislature appropriated the remaining Tire Account fund balance to clean up additional illegal tire piles. In April 1996, cleanup of a Lewis County site, a pile containing between 1.7 and 2.3 million tires, commenced. The cleanup is scheduled to be complete before July 1997. Cleanup of a site in Toppenish, with less than 200,000 tires, commenced in November 1996. The site cleanup is tentatively scheduled to be completed by early 1997.

Funds have also been used to help defray the costs to clean up a burning road fill. Tires from cleaning up an illegal site in Spokane County were chipped and used as road fill in Garfield County. Up to that time, this had been an acceptable use of shredded tires.[26] Although the cause is not fully understood, Ecology worked with the county to remove the chipped tire fill and additional contaminated material This material was disposed of in an inert/demolition landfill. Ecology has now removed the option of using chipped tires from cleanup sites as road fill.

With these last two illegal pile cleanups and the road fill mitigation, funds remaining in the account will be exhausted. The original mandate of the legislature, to clean up the original 25 unauthorized tire piles, has been completed. There are additional illegal tire piles around the state, with more coming into existence every year. Without the Tire Account funding, neither the state nor local governments have the resources to clean them up.

[26] The Washington State Department of Transportation had a similar experience in 1996 with a burning road fill composed of chopped tires in Pacific County. They also had the road fill removed and disposed. DOT has put a moratorium on future use of tire chips for deep fills.

CHAPTER IV

WASTE REDUCTION/RECYCLING

Washington state has established priorities for solid waste management in the *Solid Waste Management Act*, chapter 70.95 RCW (see sidebar). Waste reduction is the highest priority for solid waste management in Washington. Reducing the amount or toxicity of waste generated or reusing materials, waste reduction can also be thought of as "source reduction" and "waste prevention."

SOLID WASTE MANAGEMENT PRIORITIES
Chapter 70.95 RCW

1. Waste reduction.
2. Recycling, with source separation of recyclable materials as the preferred method.
3. Energy recovery, incineration, or landfilling of separated waste.
4. Energy recovery, incineration, or landfilling of mixed waste.

Even with the first measured decline in solid waste disposal rates, increased focus on waste reduction is needed. In addition, focusing efforts on major waste streams such as construction, demolition and landclearing (CDL) debris and organic are essential to minimizing the waste disposed.

ECOLOGY'S EFFORTS IN WASTE REDUCTION/RECYCLING

Waste Reduction Measurement Methodologies

Waste reduction is the top solid waste management priority, but it is inherently difficult to measure. Until waste reduction can be effectively measured, it will not get the attention that it deserves. Ecology undertook a literature review to determine the various types of waste reduction measurement methodologies that are being used around the state and country. A step-by-step guidance book on measuring waste reduction, based on existing models, is being prepared during 1996. This will provide a set of methodologies for local governments, businesses, and institutions. A variety of methodologies will be provided with the uses and benefits for particular situations identified. Training for local governments, business and institutions will be provided.

Organics

Organics, including food, yard waste, and other organic materials were estimated to make up 24.3% of solid waste disposed of in Washington State in 1992.[27] Specific aspects of composting, including yard waste and food processing waste, will be addressed in the coming biennium.

Composting

Composting is considered a key element of the state's strategy of reaching the statewide 50% recycling goal. Operators expanding or developing compost facilities face unclear and potentially inconsistent regulation from various regulating entities. The Solid Waste and Financial Assistance Program is committed to clarifying existing regulations and recommending management practices to compost facility operators, health departments, municipalities and entrepreneurs. Yard waste is a significant part of the waste stream and specific technical information needs to be available.

In 1995, efforts were begun to develop a compost facility resource handbook to interpret the regulation of compost facilities under chapter 173-304 WAC, *Minimum Functional Standards for Solid Waste Handling.* The resource handbook will integrate, to the extent possible, the regulatory interpretation of solid waste, water quality and air quality rules as they apply to compost facilities. It will also promote baseline compost facility designs and recommended management practices to protect human health and the environment, referencing existing publications and drawing on the experience from compost operations in Washington state. Ecology will work with and provide technical assistance to local governments and the private sector in the interpretation and use of the handbook.

In 1996, technical information was prepared on woody residential yard waste composting in a "What Can We Do" sheet, which defined some issues with this waste stream and referenced programs throughout the state that have addressed these issues. Strategies for collection, processing, use and marketing of the product, public information, education and funding are discussed.

Food Processing

The food processing industry primarily deals in canning, freezing and concentrating. These processes produce solid wastes in the form of pomice and sludge. The amount of this material produced is on average 2% of the material entering the plant for processing. These materials are good clean carbon sources with very little, if any, contaminants. However, these materials are potentially high in nitrogen and have a high BOD, and if mismanaged can generate groundwater pollution and even more serious problems. In addition, if these

[27] *1992 Washington State Waste Characterization Study*. (Six Volumes). Washington State Department of Ecology. July 1993. Publication #93-45.

materials are land applied too thickly, they become anaerobic and generate foul odors, in turn prompting public complaints.

The regulations and guidelines pertaining to this material are confusing and contradictory. The current regulatory posture discourages land application (a beneficial use) and encourages disposal. The costs of landfilling, in turn, encourage illegal handling and disposal of the material. Some is being disposed in landfills, some is being applied to agricultural land, some is being given away as a soil amendment, a minimal amount is composted, and a large quantity is being piled illegally. Some health departments have noticed an increase of illegal handling of this material.

Some generators are getting wastes registered as a fertilizer through the Department of Agriculture. Once these materials are registered as fertilizers, the generators claim that the material is no longer a solid waste and should not be regulated as a solid waste.

Ecology is determining the characteristics of the organic waste material from the food processing industry by using existing data from water quality permits and land application permits. In addition, Ecology will work with the food processing association to develop a survey that will help gather better data on quality and quantity of organic sludges being generated by this industry.

A guidance document is being developed to explain economical ways for land application and composting organic wastes generated by the food processing industry. It will clearly spell out how this material should be handled, focusing on pollution prevention but also providing information on disposal methods. Ecology is working closely with the Northwest Food Processors Association and the jurisdictional health departments on this document.

Ecology will work with the Department of Agriculture's Fertilizer Registration Program to develop a process to determine which fertilizer designation causes a material to drop out of the solid waste regulatory environment. Ecology will draft criteria to evaluate whether these registered organic wastes should be regulated as a solid waste. This criteria will address the quality of the organic material and potential environmental and human health impacts of not regulating it as a solid waste.

Waste Reduction/Recycling in State Government

Under the 1989 "Government Options to Landfill Disposal" (G.O.L.D.) mandate, Ecology and the Department of General Administration (GA) worked together to assist state facilities in implementing waste reduction and recycling programs. State facilities were required to reach a 50% recycling rate by 1995.

In the 1993-1995 biennium Ecology helped state facilities write and implement their G.O.L.D. plans, while GA tracked the progress state facilities made in waste reduction and recycling. The statewide recycling rate for state agencies was 37%.

As a charter member of the Green Seal Organization, Ecology has adopted policies to improve the agency's procurement of recycled and environmentally friendly products. Ecology will be encouraging other agencies to also follow Green Seal policies.

Construction, Demolition, and Landclearing Waste

In 1993, Ecology proposed to develop and implement a strategic waste management program to target construction, demolition, and landclearing (CDL) debris reduction and recycling opportunities. CDL is the term commonly used to define the waste stream generated from various site preparation, building, and demolition activities. The *1992 Washington State Waste Characterization Study* estimated CDL to comprise approximately 13-17% of the total disposed waste stream. More recent studies estimate the actual amount disposed in Washington State landfills could exceed 30%; however, generation figures could range from 50-70% of the total waste stream accounting for on- and off-site recycling, reuse including commercial salvage, burning, burying and illegal disposal.

Generally, CDL includes clean and treated wood waste, dimensional lumber, gypsum board, roofing shingles and associated waste, asphalt, concrete, brick and other aggregates, metals, plastics and tree stumps. The waste from construction sites may also include a significant amount of packaging waste including cardboard, plastic wrap and wood pallets from materials supplies.

Ecology continues efforts to facilitate the reduction and recycling of Construction, Demolition and Landclearing (CDL) debris. The following outlines some of the main activities Ecology initiated in 1995 and 1996.

- **CDL Coordinators Group**
  The CDL Coordinators Group, formed in 1994, is a collection of individuals from state and local agencies, non-profits and the private sector who are working on sustainable building issues. The Group continues its work to coordinate CDL debris reduction and recycling activities through information sharing, building upon each others efforts and conducting cooperative projects..

- **Resource Efficient Building and Remodeling Council (REBAR)**
  The Council is comprised of Spokane area representatives from all aspects of the construction industry - architects, engineers, contractors, private and public recyclers and waste haulers, waste management consultants and academics in the construction management track, local government building and planning officials - with the common mission to instill resource efficient building practices as standard operating

procedure in the construction trades in Spokane and eastern Washington. REBAR serves as sponsor for technical assistance and design consulting for several major construction projects scheduled in the Spokane area in 1996-97. Private sector representatives on the Council constitute the majority and will be assuming control of the day-to-day operation of the Council in 1996-97. Government agency representatives will remain on the Council only to provide technical assistance.

- **Environmental Building Resource Library**
  The *Environmental Building Resource Library* is a compilation of materials such as books, manuals, brochures, reports, videos and newsletters. that provide information on building in a resource efficient or environmentally sustainable manner. Bringing these resources together and making them available to interested organizations and businesses is one of Ecology's efforts to help the public and private sectors reach their goals of reducing the environmental impacts from building activities. The materials contained in this library are not only sources of technical information, but they also provide examples of how organizations around the country are targeting the construction industry. A complete set can be found at each of Ecology's regional offices (Bellevue, Olympia, Spokane, Yakima).

- **Construction Waste Recycling Demonstration Projects**
  A task force of representatives from contractors, consultants, building owners, waste haulers and recyclers was convened to successfully complete two projects in Spokane area. Tidyman's Wholesale Grocers diverted 45 tons of waste from landfilling or incineration and reduced its waste management bill by 50% in construction of a new superstore. Future Stores, Inc. gutted and remodeled an existing facility at Northpointe Shopping Center in Spokane and managed to donate enough dimensional lumber to build an entire Habitat for Humanity home and to supply usable stage sets to three local theater groups. Almost no material was removed from the site as waste. Nearly all fixtures were reused or salvaged for resale.

- **Environmental Handbook for Washington Construction Contractors - Regulatory Guidance**
  The "Environmental Handbook for Washington Construction Contractors - Regulatory Guidance" was developed to help contractors, regulators, and consumers easily identify environmental laws, regulations, and permit requirements associated with typical construction activities. To make this guide even more "user-friendly," additional information about construction employee safety and health, contractor liability and consumer issues is included in the appendices. Not all laws, regulations, and/or permit requirements are included. Instead, the handbook includes the most pertinent and generally required information. It is intended as a guidance book and not a strict interpretation of state laws. This document will be available in early 1997.

- **Resource Efficient Building Video & Film Library**
  Ecology is developing a video about resource efficient building. It is intended to raise

awareness that building can be done in a way that has less environmental impact, that adopting resource efficient practices can be done incrementally, that all players need to be part of the solution and that there are places you can go for help. The video is targeted toward a broad audience, including those in the construction industry and potential consumers (building owners). The video is being designed to allow for local government use and adaptation with local information and phone numbers. It will be available for loan, duplication, and will be broadcast on local cable television. Ecology has been video taping various demonstration homes, and CDL related events to use in the video and to establish a CDL film library.

- **Gypsum Wallboard Waste Focus Sheet**
  Ecology developed, with the review and input of the county health agencies, a focus sheet on gypsum wallboard. This focus sheet reviews the available reuse and recycling options for gypsum wallboard. It was made available to local health agencies in the fall, 1996.

- **PPG Grant Projects**

  Construction Industries Waste Prevention Workshop Series - The Northwest EcoBuilding Guild is conducting a series of "Building With Value" workshops within Washington. The workshops target building industry professionals and construction companies. They cover several topic areas related to waste prevention and waste management in design, construction, and site operations. In addition, to the workshops, articles will be published in the Guild's newsletter promoting and summarizing the concepts covered in the workshops.

  Initiative For Commercial Recycling in Skagit County - The Economic Development Association of Skagit County is the recipient of a PPG grant to encourage waste reduction and recycling in commercial, industrial, and agricultural businesses throughout Skagit County by demonstrating the methods and benefits of implementing best management practices. A follow-up grant for 1997 will establish a plan for a large multi-user office complex.

Recycling Information Line

Ecology operates 1-800-RECYCLE to help citizens find ways to reduce waste and recycle. Information includes: backyard composting techniques, disposal options for demolition debris and household toxic materials, and suggestions about alternative products posing less of a threat to human health and the environment. Most frequently asked questions by households are about household toxic material, Christmas trees, curbside programs, aluminum cans, motor oil, paper and plastic.

In 1995, the Information Line answered 35,403 calls, compared to 44,271 in 1994. Factors contributing to this decline include shorter hours of operation, fewer days of operation, and fewer staff on the information line, as well as continued expansion of

curbside collection programs, more dropbox locations, and education efforts (including local recycling hotlines) in many counties and cities. Based on the number of days the Information Line was opened for business, the average calls answered per day was 141.

Until July 1995, Ecology also operated a 1-800-LITTERS Hotline for citizens to obtain information about the litter program or to report litter violators. Litter violators were identified by the license number and vehicle description. An information letter explaining that littering is against the law, and a litter bag, were sent to registered owners of the vehicles reported. In the first 6 months of 1995, the Information Line took 759 reports of the litter violations. Because of budget reductions in the Litter Account Fund to Ecology, the Litter Hotline was terminated on July 1, 1995.

Ecology Youth Corps

In 1996, Ecology Youth Corps (EYC) picked up 156.4 tons of litter and recyclables on 1,838 miles of Washington roadways and 456 acres during the summer sweep in July and August. They turned in nearly 13.2 tons of recyclables to buy-back centers. The total miles and acres, and the total tonnages removed, was comparable to the 1995 summer sweep:

	Tons of litter & recyclables	Miles cleaned	Acres cleaned
1996	156.4	1,838	456
1995	156.0	2,552	227

The 1996 session was EYC's 21st year of operation under provisions of Chapter 70.93 RCW, the Waste Reduction, Recycling and Model Litter Control Act, "to create jobs for employment of youth in litter cleanup and related activities." With 284 14-to-17 year-olds employed for the summer and another 62 during the school term, EYC remains one of the state's biggest youth employment programs.

In addition to bagging litter and recyclables, crew members are trained in environmental education and appear at public events as agency representatives throughout the year.

EYC crews are interviewed and hired out of each of Ecology's four regional offices. The 284 youngsters for the 1996 summer sweep were assigned to 26 road crews working across the state, with 5-6 on each crew under the supervision of an experienced adult. Each crew member works one session, with a complete turnover of crews at the summer mid-point.

At least once a week during the summer, crews take recyclables to local buy-back recycling centers. In 1995 and 1996, EYC recycled the following totals:

	1995	1996
Lbs. of glass and bottles	11,574	11,167.7
Lbs. of aluminum cans	8,456.4	5,305.8
Lbs. of scrap metal	5,383	7,130.6
Lbs. of plastic & other mtls.	3,408.5	2,695.9

In addition to litter cleanup, there was time during the 1996 summer sweep for all crews to take field trips to increase their knowledge of environmental issues. Landfills, material recovery facilities, household hazardous waste collection centers, composting sites, hydroelectric dams, forestry learning centers, agricultural research stations and fish hatcheries were among the attractions visited.

Department of Transportation was unable to provide a $400,000 grant for median cleanup for the 1995-97 biennium, which restricted our work in 1996 to the summer sweep and four school crews. DOT had been providing this funding continuously since the 1983-85 biennium.

School Crew Activities, 1995-96

During the school year, EYC school crews help with school and community waste reduction and recycling projects and environmental demonstrations and displays. In 1995 and 1996, school crews were active in five counties: Skagit, Kitsap, Columbia, Walla Walla and Spokane.

The "Skagit County EYC Senate" assisted U.S. Forest Service and other local groups in building an interpretive trail along the newly-restored Boyd Creek, a tributary of the Nooksack River. The Skagit group also assisted the Skagit Fisheries Enhancement Group in planting trees along a badly-eroded stream near Mt. Vernon. During Earth Day 1996 events at Olympic College, Bremerton, the "Kitsap County EYC Senate" passed out tree seedlings at Kitsap Mall's "Kids Day." The previous month, this crew acted as docents for grade school children at the Olympic College Water Festival. The Walla Walla, Columbia and Spokane county EYC crews helped promote curbside recycling in Walla Walla, worked at the "green zone" at the Spokane Interstate Fair, taught elementary school students how to make recycled paper, worked with Spokane parks employees in the annual Christmas tree recycling effort, and helped to promote Earth Day activities in all the schools attended by the crew members. EYC crew members from this region have received awards for environmental service by the Chase Youth Commission of Spokane and the Spokane Regional Solid Waste System.

Special Cooperative and Off-Road Projects, Summer 1996

Besides roadside cleanup, crews worked with the towns of Cle Elum, Waterville, Rock Island, Wenatchee and East Wenatchee with cleanup projects. Crews also worked closely

with a watershed association doing a stream cleanup, with a non-profit recycling buy-back center sorting a backlog of recycled plastic containers, and with the Bureau of Land Management doing a campground cleanup. In 1995, crews in this region had kicked off a Stream Clean/watershed restoration program by cleaning local creeks and roads, working with several Chelan-area public agencies and environmental groups.

EYC crews continue to work closely with Washington Department of Fish and Wildlife (WDFW) to clean recreational access area. In 1995, they had helped that agency keep up with mid-summer cleaning needs at the heavily-used public access areas in Grays Harbor, Pacific, Thurston, Pierce and Mason counties. In 1996, work on these WDFW sites continued, and crews in this region also added several school sites and urban corridors to their project list. In 1996, 233.5 acres were cleaned as a result of their extensive off-road activities.

This year, one of the crews worked closely with DOT to assist in the cleanup of heavily-used stretches of highway I-90 which had been left untended by Adopt-a-Highway groups. Cooperative projects with WDFW have been a feature for several years; King and Snohomish county crews cleaned over 20 river and lake WDFW access sites in 1996. In a special cooperative project with Cedar Grove composting facility in east King county, two EYC crews cleaned the creek adjoining the site of plastic bag pieces that had escaped over the years from the composting yardwaste piles. The end result was a renewed creek, more favorable for fish habitat and spawning.

Crews added a significant total to their output total---222.5 acres cleaned as a result of special projects at Central Ferry, Lyons Ferry, Mt. Spokane, Palouse Falls, Potholes and Riverside State Parks, Columbia National Wildlife Refuge, National Park Service sites at Fort Spokane and Spring Canyon, and many other WDFW recreational areas in several counties. Most of these clients had been also served in 1995. Several crews also worked after the summer sweep at county fairs (Adams County Fair, Wheatland Fair, Palouse Empire Fair, Spokane Interstate Fair), providing information and publications and taking surveys on waste reduction, litter, recycling and household hazardous waste.

RECOGNIZING WASTE REDUCTION AND RECYCLING EFFORTS

School Awards Program

The School Awards Program was established by the Legislature in 1989, as part of the "Waste Not Washington Act." All of Washington state's schools are eligible to apply for the awards. Cash awards to public schools for their waste reduction and recycling programs. The awards program has three categories: Best Waste Reduction Program, Best Recycling Program, and Outstanding Waste reduction and Recycling Programs.

On May 10, 1996, at the seventh annual Waste Reduction and Recycling awards ceremony in the State Capitol rotunda, Governor Mike Lowry and Ecology Director Mary Riveland presented $20,000 in cash awards to 17 Washington public schools. Each school was judged on the basis of comprehensive, efficient and innovative approaches to waste reduction and recycling during the 1995-96 school year.

The winning schools (Table 4.1) were chosen for their active waste reduction and recycling programs, as well as an active educational component to support their goals. In varying degrees, each school recycles aluminum and other metals, glass, cardboard, white paper, mixed paper, newsprint, food wastes and plastic. They also practice many classroom and office waste reduction techniques, such as making two-sided copies, purchasing recycling products to close the recycling loop, reuse of various school supplies, and dozens of other techniques. With these basic practices in place, the winning 17 schools have added creative and innovative features that make their programs unique, and have involved large numbers of students, staff, teachers, parents, and community organizations in their efforts.

The Best Waste Reduction Program Winner: Granger Junior High School - $2,500

Granger Junior High School in Yakima County achieved Washington's best program by carrying out a long list of waste reduction projects in the classroom, offices, cafeteria and maintenance area. Seventeen staff members were trained through Ecology's "A-Way with Waste"[28] curriculum. Then, empowering the students to feel they can make a difference was set as a major goal. A large contingent of Granger students learned waste reduction and recycling skills, both at school and through the Washington State Extension Service and the Yakima County Solid Waste office. The students brought this training into focus through their Junior High Science Club to kick off an aggressive effort to reach their goals. The program judges verified Granger's report of $13,752 in disposal costs savings through April, representing 14 tons and 180 gallons of total waste.

Best Recycling Program Winner: Cashmere Middle School - $2,500

Cashmere Middle School in Chelan County won a very spirited competition for Washington's best recycling program by achieving a verified recycling total of 109,682 lbs, or 54.8 tons, between September and March of the 1995-96 school year. The reason, in the coordinator's words: "The district does an outstanding job of recycling all the material that can possibly be recycled, and the effort is coordinated by the middle school recycling club." Cashmere's totals included nearly two and a half tons of aluminum, 3.6 tons of newsprint, and more than one-third of a ton of plastics. The school's recycling effort is backed up by an

[28] The "A-Way with Waste" curriculum was first developed by Ecology in 1985. Teachers were trained to use the curriculum which included lessons on waste reduction, recycling, landfilling, incineration, litter control, and household hazardous wastes. Because of budget reductions in 1995, Ecology's Solid Waste and Financial Assistance program no longer conducts this training.

educational component based on lesson plans and techniques in Ecology's "A-Way with Waste" curriculum.

Table 4.1
1995 - 1996 School Awards

Award	School	Location
Best Waste Reduction $2,500	Granger Junior High School	Yakima County
Best Recycling Program $2,500	Cashmere Middle School	Chelan County
Outstanding Waste Reduction and Recycling Programs ($1,000 each)	Acme Elementary School	Whatcom County
	Adna High School	Lewis County
	Chelan High School	Chelan County
	Ephrata Middle School	Grant County
	Green Hill School	Chehalis, Lewis County
	Hazelwood Elementary School	Newcastle, King County
	Interlake High School	Bellevue, King County
	Lewis and Clark High School	Spokane, Spokane County
	Lincoln Elementary School	Olympia, Thurston County
	Mt. Erie Elementary School	Anacortes, Skagit County
	Pioneer Intermediate/Middle School	Shelton, Mason County
	Sacajawea Elementary School	Seattle, King County
	Sadie Halstead Middle School	Newport, Pend Oreille County
	Walla Walla High School	Walla Walla County
	Weyerhaeuser Elementary School	Eatonville, Pierce County

Waste Reduction and Recycling Awards

Each year, Ecology presents "Waste Reduction and Recycling Awards" at the Washington State Recycling Association Conference. These awards recognize a wide variety of programs being instituted by state and local governments, the private sector, non-profit groups and individuals, that show a commitment to finding ways to reduce waste or recycle material. Table 4.2 lists the award winners for 1996.

Table 4.2
1996 Waste Reduction & Recycling Awards for Local Government and Businesses

1995 WINNERS		
CATEGORY	**BUSINESS/ENTITY**	**ACCOMPLISHMENT**
Best Small Government Waste Reduction and Recycling Program	**Whitman County Waste Reduction and Recycling Program**	The County has undertaken some very innovative and aggressive programs over the past several years: provided curbside recycling for single and multi-family residences; produced an annual Recycling Directory; developed an interactive K-12 education program; and opened a HHW facility.
Best Large Government Waste Reduction & Recycling Program	**Thurston County and the City of Olympia (joint applicants)**	This City and County have developed a strong partnership in planning, promoting and implementing their WR/R programs. By sharing resources, they have leveraged the impact of their programs and made their individually award winning WR/R programs collectively even better.
Best Pubic Information/Education on Waste Reduction and Recycling	**King County Solid Waste Division "Waste Free Fridays" Campaign**	This program promotes waste reduction behaviors by offering incentives to County residents to change behaviors. The program relies heavily on building partnerships with private industry.
Most Innovative Waste Reduction and Recycling Program (tie)	**Next Step Association "Green Service Program"**	Over 45 automotive businesses have taken a pledge to promote recycled products to their customers, use recycled products in their own businesses, and offer environmentally responsible automotive services.
Most Innovative Waste Reduction and Recycling Program (tie)	**Snohomish County Solid Waste Division "Packaging Waste Prevention Project"**	Businesses were matched with packaging experts to decrease packaging waste and save money while retaining package function and performance. In the first year, 13 businesses save nearly $450,000.

1995 WINNERS		
CATEGORY	**BUSINESS/ENTITY**	**ACCOMPLISHMENT**
Special Recognition for Outstanding Achievement in Waste Reduction and Recycling	**The Central Market in Poulsbo**	They built a 68,000 square foot store out of recycled content building materials. Inside the building, recycling as waste reduction are integral parts of the store's daily operations. The store recycles 60% of its waste, and promotes waste reduction through reusable bags and mugs.
Best Large Business Waste Reduction and Recycling Program	**Washington Water Power "Recycling and Investment Recovery Program"**	Employee started this program in 1988. Now this company recycles over 60% of their waste by making recycling convenient to all employees. They also had an aggressive refurbishing/reuse program.
Best Small Business Waste Reduction and Recycling Program	**Hampton Inn-Bellingham Airport "Hospitality Recycling Program"**	This business uses an integrated multi-media approach to resource conservation. Recycling, waste reduction, water conservation and energy conservation all are aggressively pursued by staff with messages to guests.

CHAPTER V

THE 1995 RECYCLING SURVEY FOR WASHINGTON

In 1989, the Legislature, in amending the Solid Waste Management Act set a state 1995 recycling goal of 50%. They also stated that recycling should be made at least as affordable and convenient to citizens as garbage disposal.

In response, local governments began offering its citizens various forms of recycling ranging from drop boxes to curbside collection of a variety of recyclable materials. In 1995. more than 100 cities and counties offered curbside collection of recyclables such as glass, paper, and metals while an increasing number are offering curbside collection of yard waste.

RECYCLING RATES

Each year since 1987, Ecology has conducted a survey to measure the statewide recycling rate. Information is provided by local governments, haulers, recyclers, brokers and other handlers of materials from the recyclable portion[29] of the waste stream that are collected for recycling.

From 1987 to 1993, the measured statewide recycling rate increased from 23% to 38%. This increase had been fairly steady, with a slight dip in 1991. In 1994 the measured recycling rate remained steady at 38%. In 1995 the recycling rate resumed its climb to 39% in spite of poor markets. While the statewide measured recycling rate of 39% is still below the 1995 target of 50% recycling, several specific commodities have developed very strong recycling rates during the last three years. Table 5.1 illustrates how the recycling market has developed more breadth and depth since 1992. While, two commodities lost ground in 1995 (ferrous metals and high grade paper) they remained over 50%. The rest of these commodities maintained their recycling rates or increased substantially. This trend for an increasing recycling rate for more commodities is creating a more diverse market that is not dependent on a limited number of materials as it was in the late 1980's.

[29] The recyclable portion of the waste stream is municipal solid waste as defined by the Environmental Protection Agency in the *Characterization of Municipal Solid Waste in The United States: 1995 Update*. This includes durable goods. nondurable goods. containers and packaging. food wastes. and yard trimmings. It does not include industrial waste. inert debris. asbestos. bio-solids. petroleum contaminated soils. or construction. demolition. and landclearing debris disposed at municipal solid waste landfills and incinerators.

Table 5.1
Estimated Recycling Rates

	1992	1995			1992	1995
Ferrous Metals	81%	74%		Newspaper	58%	65%
Corrugated Paper	61%	62%		Yard Waste	34%	49%
Aluminum Cans	43%	47%		High Grade Paper	57%	46%
Mixed Waste Paper	33%	46%		Non-Ferrous Metals	43%	43%
Container Glass	27%	34%		Wood Waste	6%	31%
PET Plastics	11%	26%		Tin Cans	22%	19%
HDPE Containers	8%	15%		Food Waste	7%	14%

1995 RECYCLING SURVEY PROCESS AND RESULTS

Table 5.2 shows the recycling tonnage's for commodities from 1993 to 1995. The footnotes explain some of the discrepancies with individual commodities. There are several problems in obtaining all of the information needed to prepare a complete and accurate recycling survey. In spite of these obstacles, Ecology believes the results are reliable based on review of draft numbers sent to local governments, and comparisons to waste characterization and disposal data.

Recycling survey forms are sent to recycling firms and haulers to obtain information about types and quantities of recyclable materials collected. However, since reporting is not mandatory, and there is no penalty for not returning the information, some firms do not respond. Others, because they want to protect the confidentiality of who purchases their materials, do not complete the entire survey which leads to difficulties in under counting or double counting materials. These factors make it very difficult to compile good recycling information for specific counties. However, county information should be better this year because of greater participation by county recycling coordinators. This is discussed in greater detail later in the chapter.

Table 5.2
State Tonnage by Commodity: 1993-1995 Washington State Recycling Surveys[30]

Commodity	1993	1994	1995
Newspaper	208,603	209,415	286,984
Corrugated Paper	329,670	382,996	480,198
High Grade	81,037	61,931	50,416
Mixed Waste Paper	193,386	173,055	278,371
Aluminum Cans	18,132	16,375	21,213
Tin Cans	17,256	17,519	13,223
Ferrous Metals	796,042	772,295	691,843
Nonferrous Metals	71,079	99,827	31,559
White Goods	112,418	10,304	14,051
Refillable Beer Bottles	432	573	3,278
Container Glass	66,283	64,980	77,108
PET Bottles	1,982	3,502	4,955
LDPE Plastics	1,275	6,087	634
HDPE Containers	3,117	7,827	5,250
Other Recyclable Plastics	5,075	11,693	2,542
Vehicle Batteries	14,975	19,128	18,331
Tires	31,248	53,119	6,575
Used Oil	1,835	2,050	961
Yard Waste	320,821	319,232	295,915
Food Waste	69,996	126,409	78,148
Wood Waste	77,116	93,318	192,056
Textiles (Rags, clothing, etc.)	15,360	12,440	13,022
Gypsum	34,177	27,598	1,216
Photographic Films	468	23	20
Total Recycled	2,471,783	2,492,697	2,576,523
Total Disposed[31]	4,041,168	4,106,228	3,968,241
Total Generated	6,512,951	7,078,404	6,534,902
Recycling Rate	37.95%	37.77%	39.43%

[30] Detail may not add due to rounding.
[31] The amount of material disposed represents only the quantity defined "recyclable portion" of the waste stream and excludes industrial, inert, asbestos, bio-solids, petroleum contaminated soils, and construction, demolition and landclearing debris disposed at municipal solid waste landfills and incinerators.

CHANGES IN RECYCLING SURVEY METHODOLOGY FOR 1995

The 1995 survey was conducted using a new methodology. In the past, Ecology surveyed every business or local government that handled recyclable materials. Ecology attempted to account for all the materials through the entire system, from collection to end-user. Since reporting was voluntary, some chose not to report, others provided incomplete data. Follow-up phone calls were then needed to obtain or complete the data. Although the methodology has changed, the results are comparable to previous years because the objective of measurement is the same; the capture of recyclable material into a recycling commodity market. The main difference between the two methodologies is how Ecology avoids double counting material, described in the following paragraph.

Reduced staffing and efforts to improve the reliability of the information resulted in a new approach to the survey. Business and local government only report if they are a first time collector. Ecology does not ask for information about where the materials were sold or shipped. In an effort to minimize double counting, updates of the recycling survey were sent to the county recycling coordinators during the process for review. The updates include the business or local government responding to the survey and the total amount of recycled material, by commodity, reported for the county. The recycling coordinators were asked to look for any businesses that did not respond or for materials that could be double counted.

Local Assistance

Local government staff were recruited to work with local companies to help them understand the methodology changes, and to improve the response rate in their areas. The local government staff, usually recycling coordinators, reviewed survey updates for possible errors. County representatives helped with suggestions for streamlining data collection in their jurisdictions. The positive role of local government cannot be overstated for this year's survey. Many counties conducted extensive review of the updates and greatly improved the accuracy of the survey results. Ecology recognizes this effort and is grateful for their work.

FUTURE RECYCLING

This year we decided to compare the recycling numbers regionally. This is part of a larger effort to analyze changes in the solid waste stream since the passage of the "Waste Not Washington Act" and to formulate solid waste policy to keep improving the

recycling rate. Looking at the state's waste stream in smaller regional pieces will help Ecology make appropriate policy choices based on regional needs.

The following table (5.3) illustrates the county groupings: Central Puget Sound (CPSWGA), Western Washington (WWWGA), and Eastern Washington (EWWGA). The groupings correspond to a waste characterization study conducted by Ecology in 1992.[32] The table is grouped geographically whereas other parts of the annual report compare the counties by planning Phases.[33]. Ecology felt the groupings of Central Puget Sound, the rest of Western Washington and Eastern Washington provided good comparisons in terms of demographics and markets. These comparisons will provide useful information towards policy development for working towards the 50% recycling goal without compromising proprietary information.

[32] *1992 Washington State Waste Characterization Study*, (Six Volumes), Washington State Department of Ecology, July 1993, Publication #93-45.

[33] The planning phases are nearly identical to Waste Generation Areas with only one exception, Spokane county. Spokane is included in Phase 1[33] and not in the Central Puget Sound. Conversely, the Eastern Washington Waste Generation Area includes Spokane county and the Phase 3[33] planning group does not

Table 5.3
Recycling Tonnage by Geographic Area

Commodity	State Totals	CPSWGA	WWWGA	EWWGA	Unknown origin[34]
Newspaper	286,984	173,652	42,735	29,065	41,532
Corrugated Paper	480,198	220,855	50,758	77,240	131,346
High Grade	50,416	35,998	8,219	5,198	1,001
Mixed Waste Paper	278,372	227,573	43,361	7,438	0
Aluminum Cans	21,214	11,199	4,077	5,783	154
Tin Cans	13,223	8,075	3,173	1,951	24
Ferrous Metals	691,843	513,850	23,634	102,570	51,789
Nonferrous Metals	31,559	16,017	1,908	12,984	651
White Goods	14,051	1,676	2,529	7,347	2,500
Refillable Beer Bottles	3,278	635	2,479	164	0
Container Glass	77,109	79,888	12,016	7,651	314
PET Bottles	4,956	3,753	493	684	20
LDPE Plastics	635	280	100	235	8
HDPE Containers	5,250	3,820	701	721	3
Other Recyclable Plastics	2,542	1,820	657	63	42
Vehicle Batteries	18,332	9,947	2,470	5,874	33,480
Tires	65,745	15,630	7,148	9,487	50
Used Oil	32,019	10,830	9,693	11,446	0
Yard Waste	295,916	237,508	16,223	42,184	3,890
Food Waste	78,149	55,628	8,570	10,061	26
Wood Waste	192,056	168,327	23,275	455	0
Textiles(Rags, clothing, etc.)	13,023	7,110	349	4,119	1,445
Gypsum	1,216	250	966	0	0
Photographic Films	20	0	0	20	0
Subtotal	2,559,127	1,777,608	247,726	321,808	234,746
Tires and used oil correction[35]	7,535	1,888	1,006	1,292	3,350
Recycling Survey Total	2,566,662	1,779,496	248,731	323,100	238,096
MSW Total[36]	3,968,241	2,279,197	696,838	994,044	
MSW Generated	6,534,903	4,058,693	945,569	1,317,144	
Recycling Rate	39.28%	43.84%	26.30%	24.53%	
Pounds/day/person					
Waste generated/day/person	6.59	7.36	4.34	5.93	
Waste disposed/day/person	4.00	4.14	3.20	4.48	
Waste recycled/day/person	2.59	3.23	1.14	1.46	

Central Puget Sound Waste Generation Area (**CPSWGA**) - King, Kitsap, Pierce, Snohomish
Western Washington Waste Generation Area (**WWWGA**) - Clallam, Clark, Cowlitz, Grays Harbor, Island, Jefferson, Lewis, Mason, Pacific, San Juan, Skagit, Skamania, Thurston, Wahkiakum, Whatcom
Eastern Washington Waste Generation Area (**EWWGA**) - Adams, Asotin, Benton, Chelan, Columbia, Douglas, Ferry, Franklin, Garfield, Grant, Kittitas, Klickitat, Lincoln, Okanogan, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman, Yakima

[34] These materials could not be attributed to any particular region. They are included in the state total but not in the Generation Area totals.
[35] Used Oil is calculated at a 3% recycling rate and tires are calculated a 10% recycling rate. The calculate "unrecycled" amount is this subtracted from the total state recycling number for the "Recycling Survey Total."
[36] The amount of material disposed represents only the quantity defined "recyclable portion" of the waste stream and excludes industrial, inert, asbestos, bio-solids, petroleum contaminated soils, and construction, demolition and landclearing debris disposed at municipal solid waste landfills and incinerators.

Central Puget Sound counties account for 56% of the state's population. Eastern Washington counties account for 22% and the rest of Western Washington is also 22% of the state's total population. Table 5.3 shows recycling comparisons between geographic areas of the state. Eastern Washington has a comparable recycling rate to Western Washington excluding Puget Sound. A significant portion of the recycling tonnage is from Spokane County. One of the long standing, unofficial premises of attaining the statewide 50% goal was that Central Puget Sound would carry most of the recycling load because of their large population. If the Eastern and Western Washington Waste generation areas remain static in their recycling rates then the Central Puget Sound Area would need a 66% recycling rate for the state to reach 50%.

Not every county has a recycling goal of 50%. Many had lower goals because markets were not available for many, if not most, materials. Fortunately, markets have steadily grown since 1989, admittedly, with several ups and downs in between. Even now there are several counties that will not be able to achieve anything near 50% in the next several years due to regionally weak markets.

There are many scenarios that could be forecasted for the state to reach 50% recycling. One includes the possibility of the Eastern and Western Washington Waste Generation Areas recycling 40% then Central Puget Sound will need to recycle 58% of their waste. As illustrated in Table 5.4, twenty of the thirty-four counties in the Western and Eastern Washington Waste Generation areas have recycling goals of 40% or less. These counties have a population of 1,008,300, 19% or the state's population. If those counties limit themselves to recycling goals of 40% or less the state will not reach 50% recycling with current collection and processing technologies.

Table 5.4 **County Waste Reduction and Recycling Goals (by waste generation areas)**

County/WGA	Waste Reduction/ Recycling Goal	Recycling rate by WGA - 1995	Per capita recycling rate by WGA -1995	Population
Central Puget Sound		43.84%	3.23 lb./day	3,020,000
King	50% by 1995 65% by 2000			1,613,600
Kitsap	50% by 1995			220,600
Pierce	50% Waste Reduction/Recycling by 1995			660,200
Snohomish	24% by 1992 36% by 1995 50% by 1999			525,600
Seattle	Recycle or Compost: 40% by 1991 50% by 1993 60% by 1998			516,259[37]
Everett	35% recycling by 2005 3% to 5% waste reduction			69,974[38]

[37] This population number is included in King county's population.
[38] This population number is included in Snohomish county's population.

Western Washington		26.30%	1.14 lb./day	1,193,450
Clallam	20% by 1996 40% long range goal			63,600
Clark	50% WR/R by 1995			291,000
Cowlitz	50% WR/R by 1995			89,400
Grays Harbor	50% WR/R by 1995			67,700
Island	Assisting the state in achieving its goal of 50% by 1995			68,900
Jefferson	30% WR/R by 1996			25,100
Lewis	18% WR/R by 1995			65,500
Mason	16% WR/R by 1995			45,300
Pacific	32% WR/R by 1996			20,800
San Juan	50% by 1995			12,300
Skagit	50% or better by 1995			93,100
Skamania	40% WR/R by 1998			9,550
Thurston	40% WR/R by 1995 60% by 2000			189,200
Wahkiakum	20% WR/R by 1996			3,700
Whatcom	50% by 1995			148,300
Eastern Washington		24.53%	1.46 lb./day	1,216,450
Adams	50% WR/R by 2012			15,200
Asotin	26% by 1997			19,100
Benton	35% by 1995			131,000
Chelan	26% by 1995			60,000
Columbia	20% WR/R by 1996			4,200
Douglas	25% by 1995			29,600
Ferry	35% WR/R by 1995 50% WR/R by 2013			7,100
Franklin	35% Recycling by 1995 5% WR/R by 1998			44,000
Garfield	26% WR/R by 1997			2,350
Grant	22% WR/R by 2000			64,500
Kittitas	50% WR/R[39]			30,100
Klickitat	50% by 1995			18,100
Lincoln	35% WR/R by 1997			9,700
Okanogan	30% by 2000			36,900
Pend Oreille	45% WR/R by 2015			10,700
Spokane	50% Recycling by 1995			401,200
Stevens	36% WR/R by 2012			65,400
Walla Walla	40% by 2002			52,700
Whitman	40% WR/R estimated by 2001			40,500
Yakima	35% by 1995			204,100

The good news is that the recycling rate is increasing. Some of those counties with less than 40% goals have surpassed them. The recycling market has greatly expanded since 1989, both in the number of materials collected and individual rates for materials.

[39] Kittitas county is currently revising their solid waste plan.

Through analysis of the *1992 Waste Characterization Study*, the future looks bright for continued expansion particularly in yard, wood, and food waste. Eastern Washington still has opportunities with mixed waste paper, plastics, container glass, and tin. With better reporting in two of the state's larger counties, Washington state should look forward to breaking 40% recycling in the near future. Figure 5.1 illustrates the change in trends in the waste generated, recycled, and disposed. Recycling has increased steadily while disposal and total generation has leveled in the last two years.

Figure 5.1
Pounds Disposed, Recycled and Generated Per Person/Day

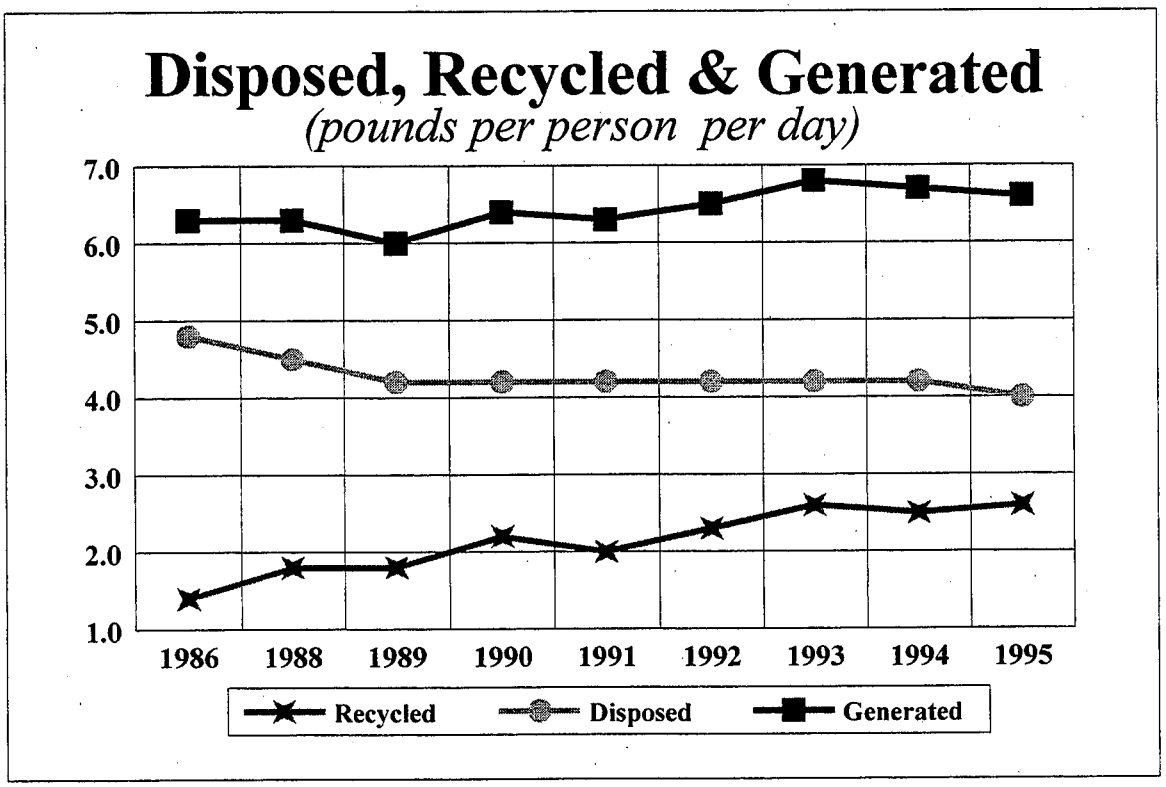
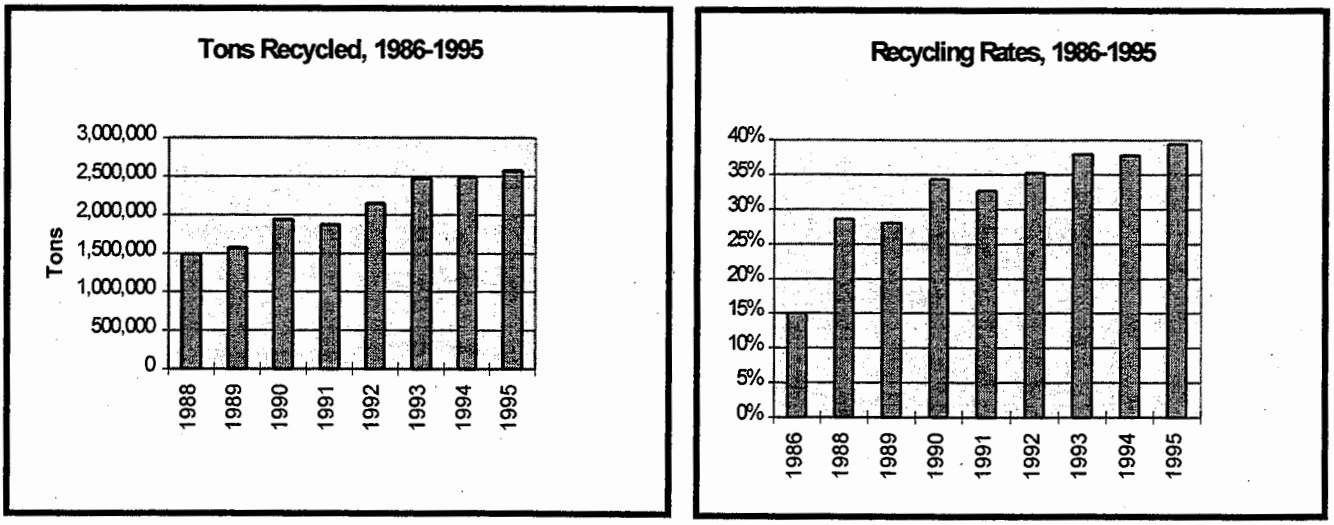


Figure 5.2 illustrates the trend in recycling tonnage and recycling rates since 1986.

Figure 5.2
Tons Recycled and Recycling Rates, 1986-1995



CHAPTER VI

DISPOSAL OF SOLID WASTE IN WASHINGTON

One of the goals of this report is to identify the types and quantities of solid waste disposed in the various types of landfills and energy recovery facilities in the state. This includes waste imported into the state for disposal and waste exported to Oregon.

Landfilling is the basic method of final disposal and includes five types of landfills - municipal solid waste landfills, woodwaste landfills, limited purpose landfills, inert/demolition landfills and ash monofills.

As part of the annual reporting requirements of the MFS, in January 1995, forms were sent to the various types of landfills[40] for them to report the types and quantities of waste they received for disposal. The categories of solid waste specified on the form were municipal, demolition, industrial, inert, commercial, woodwaste, sewage sludge, asbestos, petroleum contaminated soils, tires and other. The facilities were also asked to report the source of their waste, by county, out-of-state or out-of-country.

The other method of waste disposal in Washington is energy-recovery facilities. Annual report forms were also sent to these facilities. The same types of waste information was requested as for landfills.

MUNICIPAL SOLID WASTE LANDFILLS

Amount of Waste Disposed in Municipal Solid Waste Landfills

In 1995, 24 municipal solid waste landfill accepted waste totaling 4,001,815 tons.[41] Of the 24 landfills, 18 were publicly owned, and six were privately owned.

In analyzing the size of the MSW landfills it was found that of the 24, six received over 100,000 tons of waste in 1995, while 3 received less than 10,000 tons. In 1994, 12 MSW landfills received less than 10,000 tons. This trend indicates that the smaller facilities

[40] Only one ash monofill in Washington is located at the Roosevelt Regional Landfill. Information about the special incinerator ash disposed is provided in their annual report for their municipal solid waste landfill at the same site.

[41] Throughout this report, different disposal amounts are discussed. These numbers vary based on the types of facilities being discussed, the source of the waste and the purpose of the discussion. For example, the recycling survey only accounts for "traditional" municipal waste in the disposed amount used to calculate the statewide recycling rate. See discussions in Chapter V and this chapter for further information.

have been closing in response to more stringent regulations. Three of the largest landfills and all of the smaller landfills are publicly owned.

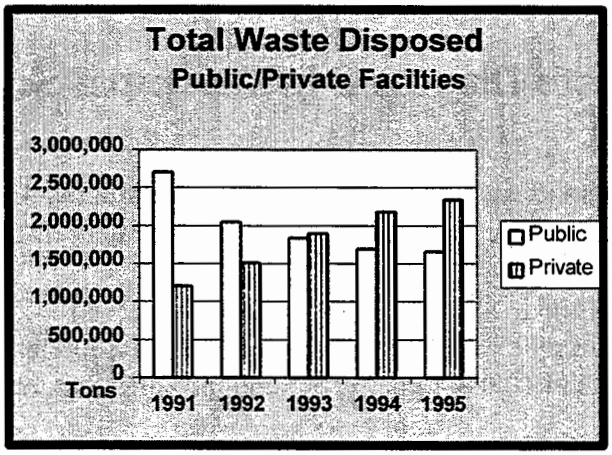
Table 6.1 depicts the relationship of waste disposed to public/private ownership. As the table illustrates, 1,656,115 tons of solid waste disposed went to publicly owned facilities (41%), with the remaining 2,345,700 tons going to private facilities (59%).

Table 6.1
Total Waste Disposed in MSW Landfills

OWNERSHIP	NUMBER OF MSW LANDFILLS			AMOUNT OF WASTE DISPOSED (Tons)			% TOTAL WASTE DISPOSED		
	1991	1993	1995	1991	1993	1995	1991	1993	1995
PUBLIC	36	35	18	2,696,885	1,832,928	1,656,115	69	49	41
PRIVATE	9	8	6	1,192,207	1,893,127	2,345,700	31	51	59
TOTAL	45	43	24	3,889,092	3,726,055	4,001,815	100	100	100

The amount of waste disposed in MSW landfills shows movement from the publicly owned facilities to those owned by the private sector (see Figure 6.1). The trend has continued since 1991, when the state first started tracking this type of information. The amount of waste disposed in the private facilities has increased from 31% since 1991 to 59% in 1995. The majority of this increased amount can be accounted for by the Roosevelt Regional Landfill in Klickitat County.

Figure 6.1
Total Waste Disposed — Public & Private Facilities



Types of Waste Disposed in Municipal Solid Waste Landfills

Traditionally, many people think of the waste disposed of in MSW landfills as being mostly household waste.[42] Annual facility reports show that a much wider variety of waste is disposed of in the MSW landfills. These wastes need to be considered in terms of remaining available capacity. Eleven of the 24 landfills reported a significant amount of solid waste disposed, other than municipal solid waste. Demolition, industrial, commercial, woodwaste, sludge, petroleum contaminated soils (PCS) and tires were the major waste streams. Table 6.2 summarizes the types and amounts of waste disposed of in MSW landfills from 1991 through 1995.

Table 6.2
Waste Types Reported Disposed in MSW Landfills

WASTE TYPES	1991 (Tons)	1992 (Tons)	1993 (Tons)	1994(Tons)	1995(Tons)
Municipal Solid Waste*	3,211,857	2,694,800	2,641,551	2,725,084	2,777,030
Demolition Waste	191,518	250,144	331,231	459,979	382,513
Industrial Waste	189,908	101,607	44,471	150,218	161,779
Inert Waste	2,023	1,027	0	31,248	5,154
Commercial Waste	157,862	143,466	180,691	92,498	142,258
Woodwaste	39,184	60,523	98,595	22,668	37,850
Sewage Sludge	42,618	64,311	33,854	64,364	66,728
Asbestos	3,931	8,247	7,076	11,819	7,859
Petroleum Contaminated Soils	66,879	224,560	273,429	249,552	255,288
Tires	na	na	1,288	1,815	28,712
Other**	4,357	12,053	113,869	69,371	136,644
TOTAL	3,910,137	3,560,738	3,726,055	3,878,615	4,001,815

* Some facilities include demolition, industrial, inert, commercial and other small amounts of waste types in the MSW total.

** Some of the "other" types of waste reported include auto fluff, non-municipal ash and white goods.

In examining the types of waste that were disposed in the MSW landfills in 1995, there was a slight decrease in demolition waste, inert waste and asbestos.. Increased amounts were reported for all other waste types.

Some of the decrease demolition waste reported is likely attributed to the Ft. Lewis landfill. The Ft. Lewis Military base was demolishing old barracks and other unneeded structures as part of the military downsizing in 1994 and had completed much of that effort by 1995. However, some of the reduction from Ft. Lewis was offset by an increase in demolition waste at some landfills in parts of the state that experienced flooding and related flood debris disposal. Waste reduction and recycling efforts for CDL may also be having an impact on this waste stream. Future trends and increased tracking through the recycling survey will provide better information.

[42] "Household waste" as defined in chapter 173-351 WAC, *Criteria for Municipal Solid Waste Landfills*, means any solid waste (including garbage, trash, and sanitary waste in septic tanks) derived from households (including single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas).

An increase in the amount of tires disposed at MSW landfills is a result of some failed recycling efforts for tire pile cleanups (see Chapter III). Recycling of tires is currently not occurring vary widely in Washington. Illegal tire piles cleanups are being diverted to landfills for disposal.

WASTE-TO-ENERGY/INCINERATION

In 1995, five waste-to-energy facilities/incinerators burned 397,588 tons of solid waste. Of that amount, 3,869 tons was identified as woodwaste at the Inland Empire Paper facility in Spokane. This is the only incinerator that does not burn municipal solid waste. The amount of solid waste incinerated statewide decreased from 10% to 9%.

ASH MONOFILL

For waste-to-energy facilities or incinerators that meet both the chapter 173-304 WAC and chapter 173-306 WAC (see in Chapter II), the ash generated from the facilities must be disposed in a properly constructed ash monofill. There are four remaining energy recovery/incinerators that meet these criteria. All of the municipal solid waste incinerator ash (115,095 tons) from those facilities is disposed at the ash monofill at the Roosevelt Regional Landfill in Klickitat County.

TRENDS IN MUNICIPAL SOLID WASTE DISPOSAL METHODS

The two basic ways to dispose of solid waste are landfilling and burning. A comparison of the amount of solid waste disposed in municipal solid waste landfills and waste-to-energy facilities and incinerators in 1995 is shown in Table 6.3.

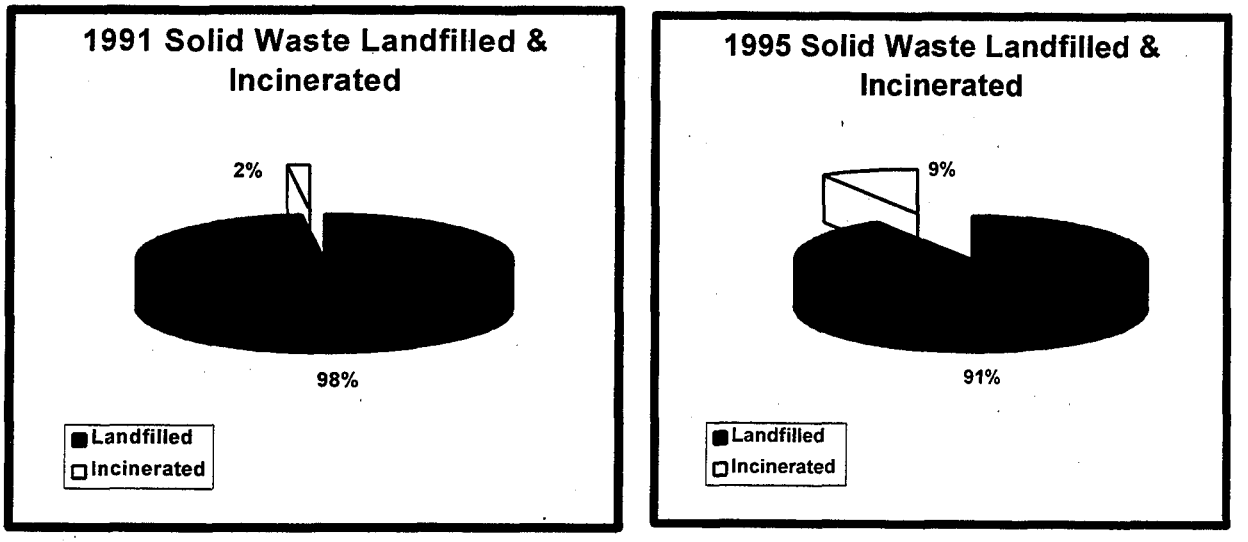
Table 6.3
Waste Disposed in MSW Landfills and Incinerators in 1995

FACILITY TYPE	TONS	PERCENT (%)
MSW Landfills	4,001,815	91
Incinerators	397,588	9
TOTAL	4,399,403	100

The largest change in disposal methods over the past few years has been between landfilling and energy recovery/incineration. In 1991, 98% of the waste was disposed in MSW landfills and 2% was incinerated. In 1994, the split was 90% landfilled and 10% incinerated. In 1995, there was a slight decrease to 9% incinerated. (See Figure 6.2)

This split between waste landfilled and incinerated will likely remain relatively stable over the next few years because no new large waste-to-energy facilities or incinerators, or expansions of existing facilities, are currently planned.

Figure 6.2 **Comparison of Solid Waste Landfilled & Incinerated 1991 and 1995**



INERT/DEMOLITION, LIMITED PURPOSE AND WOODWASTE LANDFILLS

In addition to municipal solid waste landfills, there are three other types of landfills in the state: inert/demolition, limited purpose, and woodwaste. These three types of landfills are defined in the MFS as discussed in Chapter II. Annual report forms received from these types of landfills show a variety of waste types disposed, as seen in Tables 6.4 - 6.6.

Table 6.4
Waste Types and Amount Disposed at Woodwaste Landfills

WASTE TYPES	1992	1993	1994[43]	1995
Municipal	0	0	0	0
Demolition	57,328	20,775	0	8,600
Industrial	0	0	0	0
Inert	0	0	0	0
Commercial	0	0	0	0
Wood	122,381	96,708	93,310	105,080
Sludge	0	0	0	0
Asbestos	0	0	0	0
PCS	0	0	0	0
Tires	0	0	0	0
Other	1,785	4,614	3,213	2,079
TOTAL (tons)	181,494	122,097	96,523	115,759

[43] Data entry error from 1994 corrected. An additional 63,898 tons of woodwaste waste disposed in 1994.

Table 6.5
Waste Types and Amount Disposed at Inert/Demolition Landfills

WASTE TYPES	1992	1993	1994	1995
Municipal	0	0	0	0
Demolition	750,627	168,066	157,758	103,903
Industrial	0	0	0	0
Inert	139,366	272,047	200,172	121,943
Commercial	0	0	0	0
Wood	609	120	0	167
Sludge	0	0	0	0
Asbestos	0	12	4	0
PCS	0	16,233	19,179	18,295
Tires	0	500	0	0
Other	14,486	377,260	280,501	235,330
TOTAL (tons)	905,088	834,238	657,614	479,638

Table 6.6
Waste Types and Amount Disposed at Limited Purpose Landfills

WASTE TYPES	1992	1993	1994	1995
Municipal	0	0	0	0
Demolition	13,698	12,894	95,568	151,230
Industrial	194,689	17,680	212,008	315,930
Inert	44,572	37,274	104,419	138,577
Commercial	0	25,019	0	0
Wood	94,541	156,261	86,088	58,628
Sludge	0	0	21	0
Asbestos	0	0	226	797
PCS	0	99,360	82,279	148,932
Tires	0	0	0	0
Other	35,615	59,259	60,642	40,797
TOTAL (tons)	383,115	407,747	642,251	874,116

A high demand for wood products has increased the reuse and recycling of woodwastes that had been disposed in the past. This is shown in the decrease in woodwaste disposed at both municipal landfills and at the woodwaste landfills. Reduced amounts of woodwaste were also reported at inert/demolition and limited purpose landfills.

The decrease of total waste reported for inert/demolition landfills and the increase for limited purpose landfills is partially attributed to the change in classification of one of the major landfill. In addition, a limited purpose landfill that opened in late 1993 was in full operation in 1994.

MOVEMENT OF SOLID WASTE

Movement of Waste Between Counties

All landfills and incinerators were asked to report the source, types and amounts of waste they received from out-of-county. Twelve of the 24 active MSW landfills reported receiving over 1.5 million tons of solid waste from other counties in 1995. One waste-to-energy facility received a small amount of waste from beyond its home county and ten other types of landfills (woodwaste, inert/demolition and limited purpose) received over 109,000 tons of waste, predominantly PCS, inert/demolition waste and non-municipal ash from other counties.

Some of this waste movement was because of closer proximity to a neighboring county's landfill, other counties are looking to other locations for some or all of their waste disposal. Some of the waste disposed from other counties was "specialty" waste such as PCS.

With the closure of many local landfills because of the new state/federal regulations, Roosevelt Regional Landfill in Klickitat County, and to a lesser extent, Oregon regional landfills have become the chosen disposal option. The Roosevelt Regional Landfill received some type of solid waste from 33 of the 39 Washington counties (13 additional counties since 1992) and also from out-of-state and out-of-country. For many counties that still have operating MSW landfills, Roosevelt Regional Landfill has become an option to dispose of some of their non-municipal waste, thus saving local landfill capacity for future need. Nine of the 33 counties rely on Roosevelt for their solid waste disposal. Four other counties and the City of Seattle send the majority of their solid waste to Oregon facilities.

A newly opened (late 1993) limited purpose landfill in Cowlitz County, owned by Weyhaeuser, received over 15,000 tons of solid waste, mostly PCS and non-municipal ash, from other counties. Another limited purpose landfill that treats PCS received over 60,000 tons of soil from other counties.

Waste Imported from Outside the State

Washington state landfills and incinerators were also asked to report the source, types and amounts of waste received from out-of-state or out-of-country. In 1995, a total of 218,970 tons of solid waste, less than 4% of the waste disposed and incinerated in Washington, was imported from beyond the state's boundaries for disposal. In 1994, 67,113 tons of waste, 1% of the disposed amount, was imported.

The majority of this waste went to two municipal landfills. Some of the waste, such as PCS and waste from the wood processing industry, was imported to a limited purpose landfill in 1995.

The types of waste received from out-of-state for disposal are shown in Table 6.7. The most significant change occurred in MSW waste, with over 85,000 tons going to the Roosevelt Regional Landfill. The majority of that (75,000 tons) was imported from California, with the remainder from Alaska and Oregon. Roosevelt also received the majority of out-of-state demolition waste, PCS and tires. The Weyerhaeuser limited purpose landfill in Cowlitz County received most of the industrial waste, waste resulting from their other wood processing operations in Oregon.

Nez Perce County, Idaho, disposed of 25,900 tons of MSW in the Asotin County Landfill. This disposal is considered incidental movement because Asotin County, Washington, and Nez Perce County, Idaho, prepared a joint local comprehensive solid waste management plan to meet the requirements of Washington state statute and have an agreement for joint use of the landfill.

Table 6.7
Out-of-State Waste Disposed in Washington

TYPE OF WASTE	QUANTITY (TONS)				
	1991	1992	1993	1994	1995
Municipal Solid Waste	24,475	27,114	26,993	27,330	111,395
Demolition	1,412	0	147	1,095	6,643
Petroleum Contaminated Soils	0	12,388	16,698	33,136	54,839
Industrial	0	0	0	4,269	39,990
Asbestos	0	41	735	206	401
Sludge	36	34,457	0	33	0
Woodwaste	208	27,492	24,486	120	1,897
Tires	0	0	0	0	3,594
Other	0	0	0	924	210
TOTAL	26,131	101,492	69,059	67,113	218,970

Under the "Guidelines for Reporting Imported Solid Waste"[44] MSW landfills or incinerators receiving waste from out-of-state are required to notify Ecology if the amount from one generator will exceed 10,000 tons per year. An equivalency determination for the state or province is required. In addition, the facility must submit quarterly reports on all solid waste received from out-of-state.

Roosevelt Regional Landfill is currently the only landfill falling under the reporting guidelines. They have reported for each quarter since the guidelines have been in place. Based on the first two reporting quarters for 1996, rates of waste imported remain about the same as for 1995.

[44] *Guidelines for Reporting Imported Solid Waste*. Department of Ecology. Publication #94-140. September 1994.

Waste Exported from the State

Another aspect of solid waste movement is the amount exported from Washington to another state for disposal. In 1995, a total of 851,885 tons of waste generated in Washington was disposed in Oregon landfills, an increase from 770,514 tons in 1994. Table 6.8 compares the waste amounts and types exported and imported.

Major exporters of municipal solid waste in Washington included the city of Seattle (467,173 tons, mostly MSW), Clark County, Pacific County, Pierce County (82,632 tons, mostly demolition waste), Island County, Benton County and Whitman County. Reasons for exportation out-of-state are related to the closure of local landfills and negotiation of favorable long-haul contracts with Oregon facilities.

Table 6.8
Comparison of Imported-to-Exported Waste for all SW Facilities

TYPE OF WASTE	IMPORTED		EXPORTED	
	1994	1995	1994	1995
Municipal Solid Waste	27,330	111,396	737,309	709,133
Demolition	1,095	6,643	11,130	113,097
Petroleum Contaminated Soils	33,136	54,839	7,555	9,760
Asbestos	206	401	2,709	3,031
Industrial	4,269	39,990	3,034	6,773
Woodwaste	120	1,897	0	0
Sludge	33	0	2,834	5,212
Tires	0	3,594	0	0
Other	924	210	5,943	4,879
TOTAL	67,113	218,970	770,514	851,885

Trends in Interstate Waste Movement for Washington

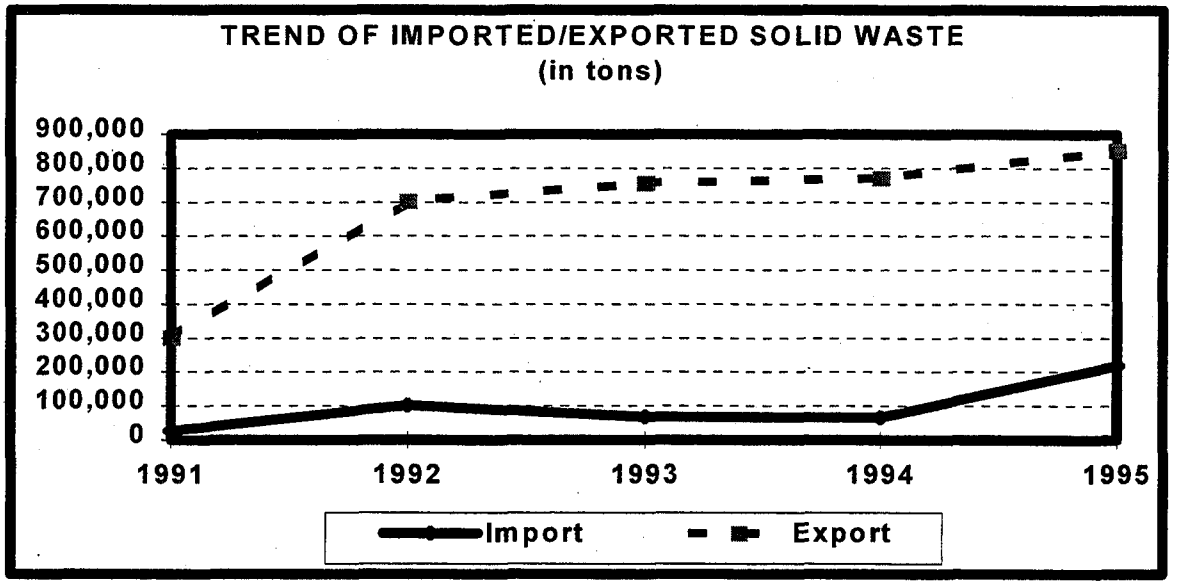
The first significant movement of waste across Washington state boundaries started in 1991. In mid-1991, the City of Seattle started long-hauling waste to the Columbia Ridge Landfill in Arlington, Oregon. In late 1991, the Roosevelt Regional Landfill began operating in Klickitat County, Washington. That year, waste was accepted from Oregon, Idaho and British Columbia.

As can be seen in Figure 6.3, Washington exports have been much higher than imports since 1991. With the expansion of waste taken at Roosevelt Regional Landfill however, the amount of imported waste is increasing. Still, almost four times as much is exported to Oregon to two landfills, Columbia Ridge and Finely Buttes.

Should another large regional landfill be sited in Washington, it is likely that much of the waste currently being exported to Oregon would then be disposed of in-state. The

Roosevelt Regional Landfill continues to market their landfill for waste from other states as well as other countries.

Figure 6.3
Trend of Imported/Exported Solid Waste



DETERMINING THE AMOUNT OF SOLID WASTE DISPOSED

The figure arrived at for the amount of solid waste disposed varies depending upon the types of wastes included, the source of waste generation or the types of facilities included in the calculation.

Waste Generated by Washington Citizens for Disposal at MSW Facilities

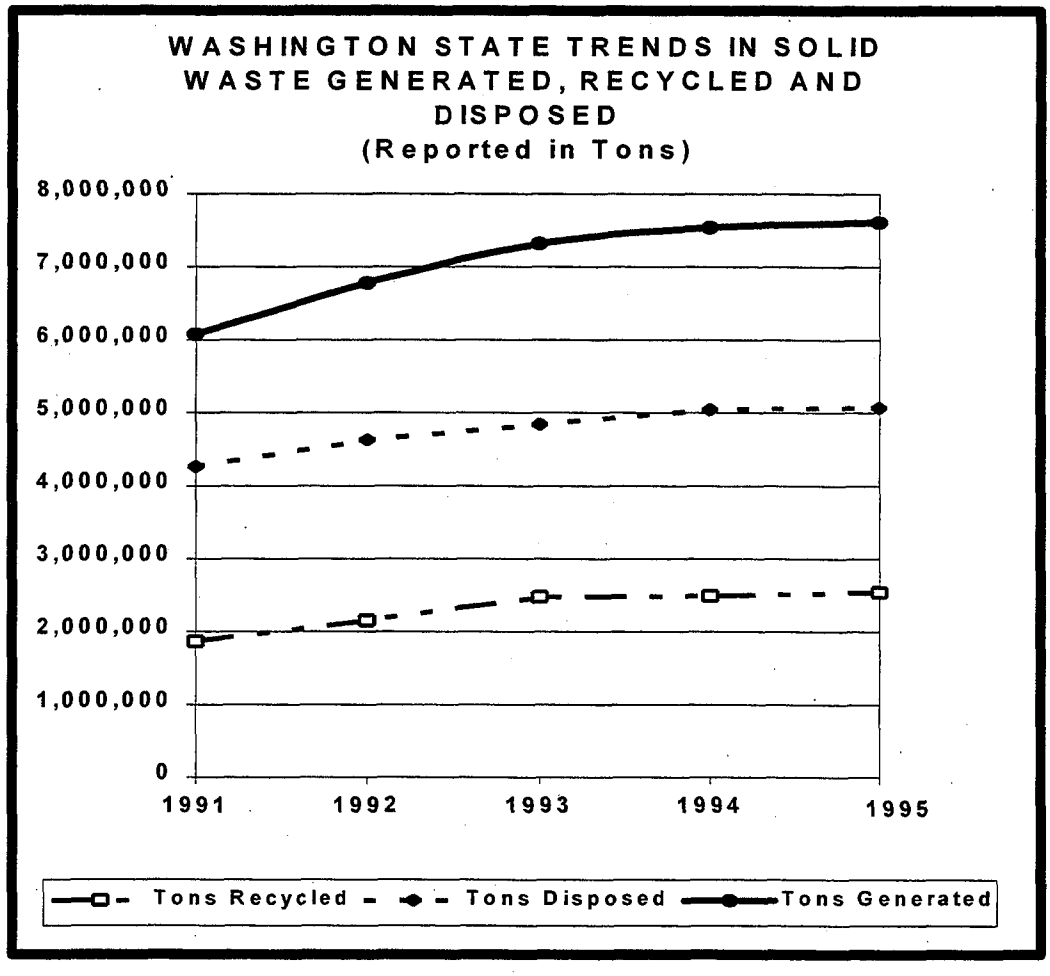
Since 1987, Ecology has conducted a recycling survey that has reported the amount of waste generated, recycled and disposed each year. This waste stream was the "recyclable waste stream" made up of waste types included in the recycling categories, but not including sludge, asbestos, petroleum contaminated soils, construction and demolition, or industrial waste (when it could be specifically identified[45]). It was also typically the waste stream generated and reported by municipalities (cities and counties). The report

[45] Some facilities and government entities that report information for the annual recycling survey on waste generated and disposed include other waste in with the total for municipal solid waste. These waste types are typically inert, demolition, industrial, and commercial.

for the recycling survey included waste that was disposed of outside of Washington, but excluded imported waste.

Figure 6.4 shows the amount of waste recycled, disposed and generated in Washington. It is based on waste disposed at MSW landfills and incinerators in Washington and Oregon, excluding imported waste. All types of waste are included in the disposal numbers. The trend seen is an increase in all of the amounts generated, recycled, and disposed.

Figure 6.4
Washington State Trends in Solid Waste Generated, Recycled and Disposed



Washington state's population has continued to grow since disposal numbers were tracked in 1991 (see Table 6.9). The increased population has had a correlated increase in waste disposed. However, when the per capita rate of disposal is evaluated, the tons disposed per person per year decreased slightly.

Table 6.9
Washington State Population

1991	5,000,385
1992	5,116,685
1993	5,240,900
1994	5,334,400
1995	5,429,900

Figure 6.5 analyzes the trends in per capita generation, recycling and disposal. This looks at the number of tons per year generated, recycled and disposed by each person. The total is not what each person produces at each household, but includes all residential, business, commercial and industrial waste generated in the state that is disposed of in municipal solid waste landfills and incinerators. Table 6.10 shows the per capita numbers from 1991 through 1995.

Figure 6.5
Washington State Trends in Solid Waste Generated, Recycled and Disposed
(Tons Per Person Per Year)

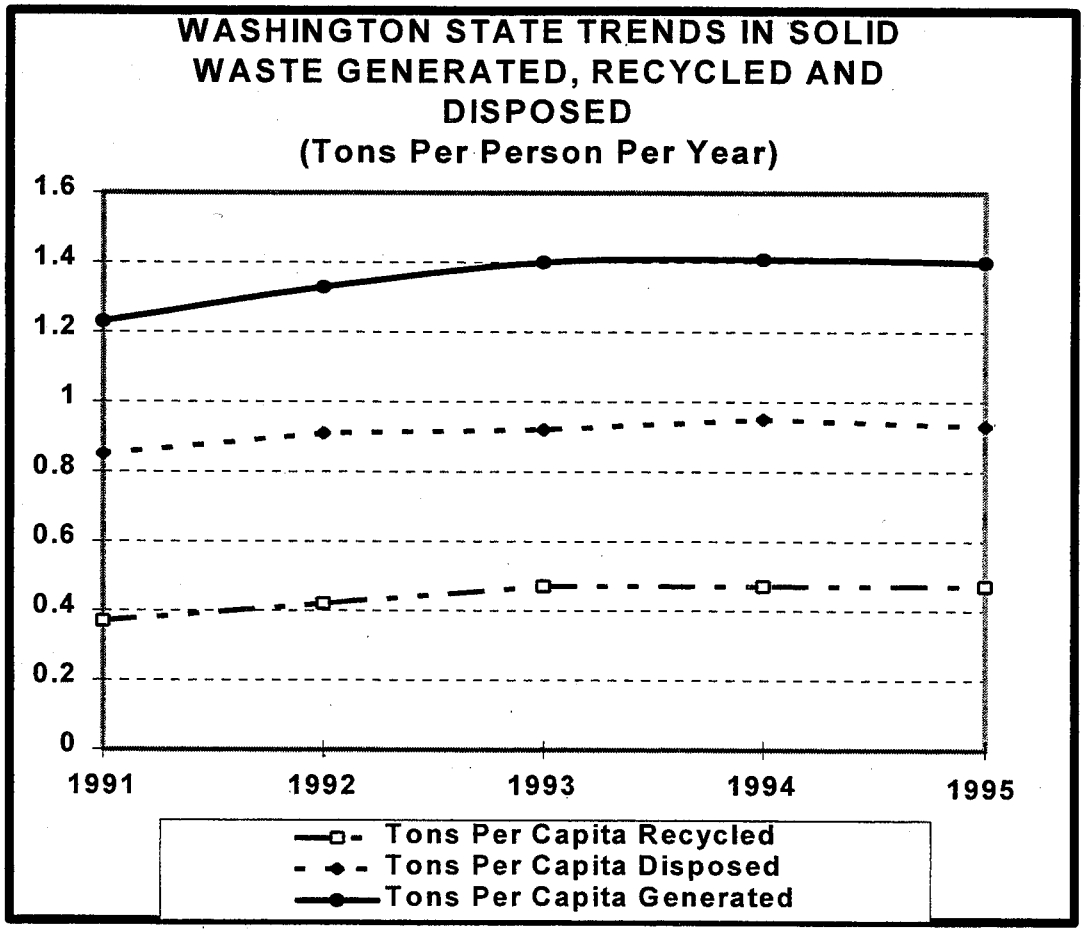


Table 6.10
Per Capita Disposed, Recycled and Generated Numbers (tons/person/year)

Per Capita	1991	1992	1993	1994	1995
Disposed[46]	0.85	0.91	0.92	0.95	0.93
Recycled	0.37	0.42	0.47	0.47	0.47
Generated	1.23	1.33	1.40	1.41	1.40

As the population continues to increase, the total amount of waste generation will continue to increase. That is why the current emphasis on household recycling should continue and an increasing emphasis on waste reduction by the residential sector and waste reduction and recycling by the commercial and industrial sector needs to become a priority.

Total Waste Disposed in Washington State

The three other categories of landfills for which information was obtained this year include woodwaste, inert/demolition and limited purpose. The waste disposed in these facilities is more typically generated by the private sector (business and industry). There is a significant amount of waste that is disposed of in-state that is not included in the disposal numbers discussed above.

To gain a more complete picture of solid waste disposal in the state, it is necessary to include all categories of waste that are disposed or incinerated in Washington state landfills and incinerators. This includes waste imported from out-of-state, but does not include exported waste. When all categories are included, 5,868,916 tons of waste were disposed of in all types of landfills and incinerators in Washington in 1995 (see Table 6.11).

Table 6.11
Total Amounts of Solid Waste Disposed in Washington

	AMOUNT OF WASTE (TONS)			
DISPOSAL METHOD	1992	1993	1994	1995
Municipal Solid Waste Landfills	3,560,738	3,726,055	3,878,615	4,001,815
Incinerated MSW Waste	424,387	431,928	421,626	397,588
Woodwaste Landfills	181,494	122,097	32,625	115,759
Inert/Demolition Landfills	905,088	834,238	657,614	479,638
Limited Purpose Landfills	383,115	407,747	642,251	874,116
TOTAL	5,454,822	5,522,065	5,632,731	5,868,916

[46] Disposed amounts include all waste generated from Washington disposed in MSW landfills and incinerators.

REMAINING CAPACITY

Future Capacity at Municipal Solid Waste Landfills

Increased standards required by chapter 173-351 WAC, *Criteria for Municipal Solid Waste Landfills*, resulted in the closure of 22 municipal solid waste landfills since 1991. Those that had little or no remaining capacity (less than 1% of the total capacity reported in 1994) decided not to expand because of the expense in meeting the new requirements. Others, although they had some remaining capacity, decided to close rather than upgrade to meet the new requirements. Only 23 MSW landfills remained operating at the end of 1995. (See Map A for the location of operating MSW landfills and incinerators.)

The amount of remaining capacity for the 23 MSW landfills was determined by asking the facilities to report remaining permitted capacity, as well as the expected closure date. In 1996, the facilities estimated about 162 million tons, or 41 years, of capacity at the current disposal rate. In 1994, facilities reported approximately 181 million tons of remaining capacity, about 49 years of remaining capacity statewide.[47] The reduction in almost 20 million tons of capacity was only partially from waste disposed. Changes in permit conditions, landfill closures and projections of fewer expansions account for part of the decrease. Of the 23 currently operating landfills, only 15 have an estimated 10 years of remaining capacity. (See Table 6.12 for an estimated number of facilities with specified remaining years of life.) Map B shows the counties and the remaining years of capacity of their MSW landfills.

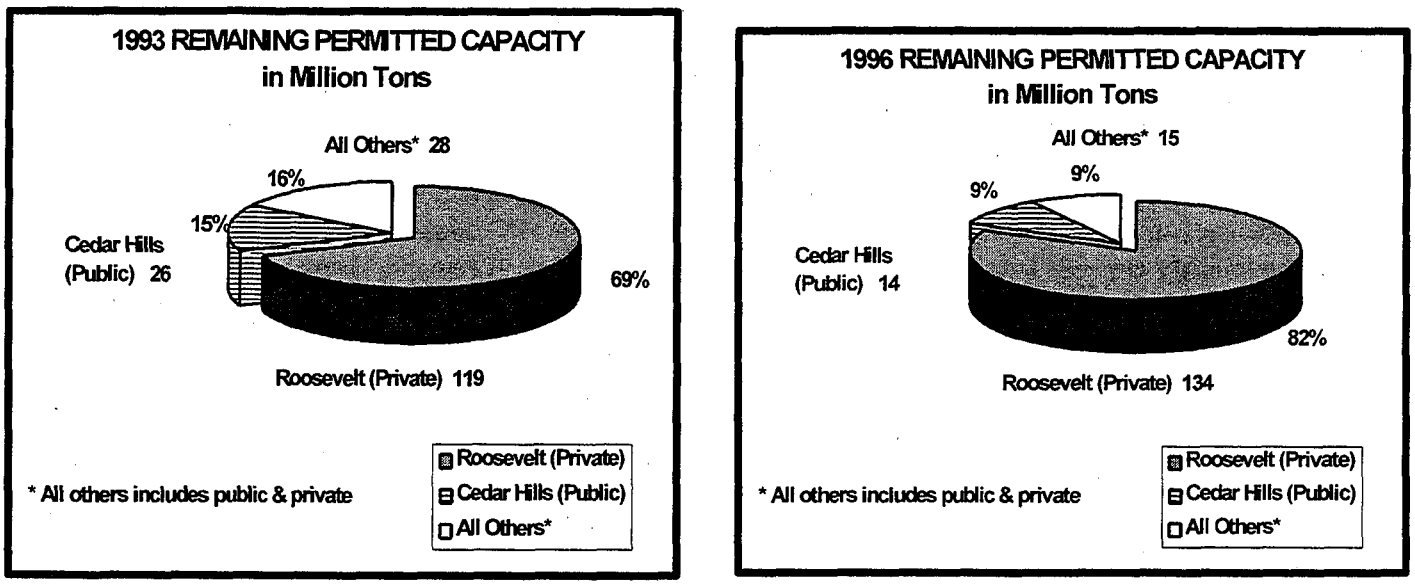
Table 6.12
Estimated Years to Closure for MSW Landfills

YEARS TO CLOSURE	NUMBER OF FACILITIES	PUBLIC	PRIVATE
Less than 5 years	2	1	1
5 to 10 years	6	4	2
Greater than 10 years	15	12	3
TOTALS	23	17	6

Seventeen of the 23 operating MSW landfills are publicly owned. However, 85% of the remaining permitted capacity is at the six privately-owned facilities, compared to 73% in 1993. The majority of the capacity, about 82% of the total statewide capacity, is at the privately owned Roosevelt Regional Landfill in Klickitat County. Another 9% of the statewide total capacity is at the publicly-owned Cedar Hills Landfill in King County, with the remaining 9% of capacity spread among the remaining 21 landfills in the state (see Figure 6.6).

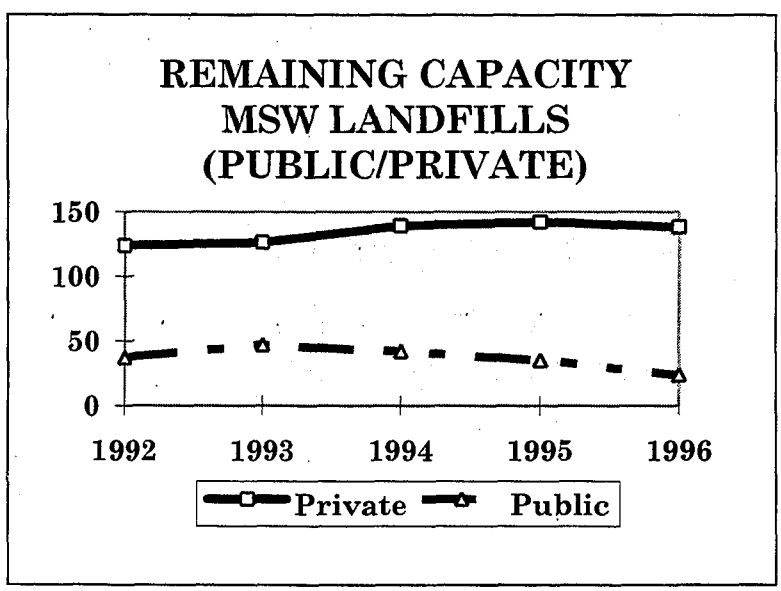
[47] *Solid Waste in Washington State - Third Annual Status Report*. Department of Ecology. Publication #94-194. December 1994.

Figure 6.6
Comparison of Remaining Permitted Capacity
1993 and 1996



The remaining capacity at private landfills has exceeded that for public facilities since the amounts were tracked in 1992. For both ownership types, the remaining capacity is starting to decrease, more rapidly at the public facilities. Of the 162 million tons of remaining capacity, only 24 million tons (about 15%) in the public landfills.

Figure 6.7
Remaining Capacity MSW Landfills

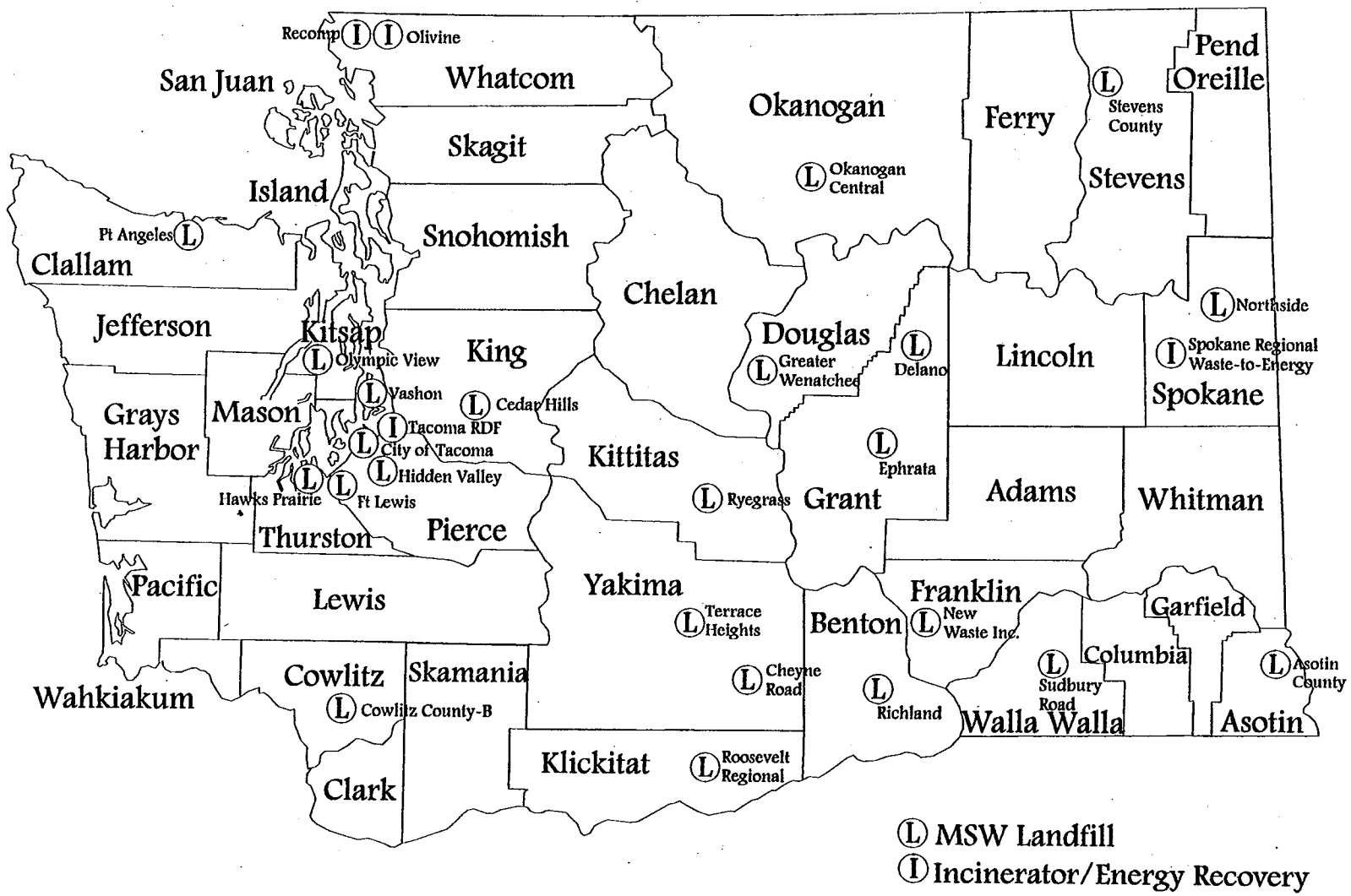


Besides the amount of remaining capacity, the availability of that capacity needs to be considered. The Roosevelt Regional Landfill is operated to accept waste from a wide variety of locations. In 1995, the facility received some type of solid waste from 33 counties in Washington, including the majority of the solid waste from nine

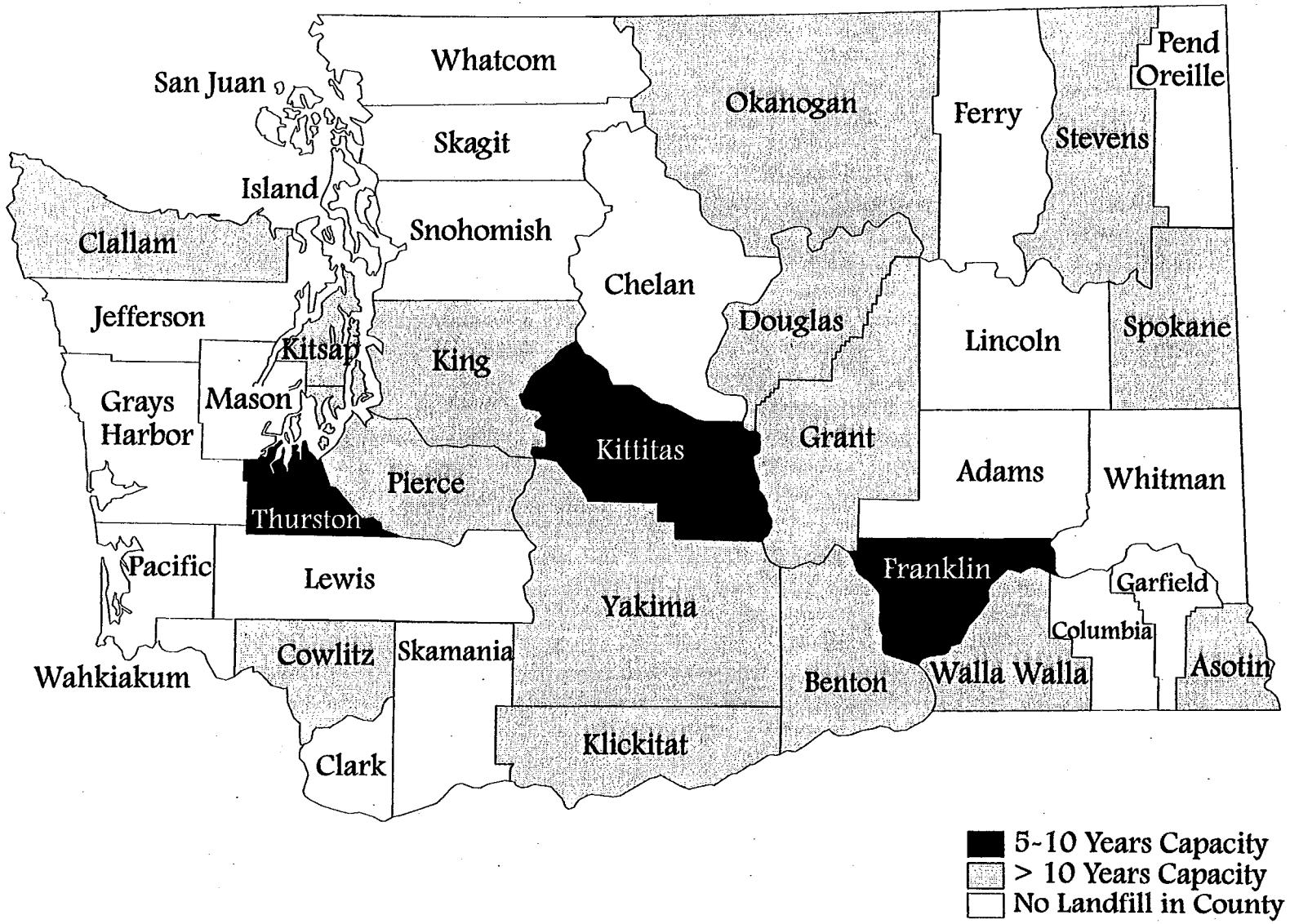
counties. Waste was also received from five other states, British Columbia and Antarctica. Other landfills in the state are operated to accept the majority of waste from the county in which they operate. In order to reserve the capacity for local citizen needs, some are also using the regional facility for some of their disposal needs.

The 41 year estimate of total capacity is based on the amount of waste disposed in MSW landfills in 1995. This amount will vary depending upon waste reduction and recycling activities, population growth or decline, as well as the impact of waste being imported into the state for disposal or additional waste, which currently being disposed out-of-state being disposed in state. As discussed previously, there has been an increase in the types of waste, other than municipal waste, being disposed of in MSW landfills. Part of this is the liability concern (that is, it is better to pay a higher cost and transport further to dispose in a well designed landfill). If requirements for other types of landfills (woodwaste, inert/demolition, and limited purpose) become more stringent in the future, some of those facilities may close and there may be an additional shift of the types of solid waste moving to the MSW landfills for disposal.

MAP A: Location of MSW Landfills and Energy Recovery Facilities



MAP B: Remaining Permitted MSW Landfill Capacity (as of April 1996)



Changes in the state *Model Toxics Control Act* and in Federal and State hazardous waste regulations are also adding to waste volumes ending up in MSW landfills. These changes are as follows:

- Some cleanup wastes that otherwise would qualify as "state-only" dangerous waste may be allowed to be disposed of in a solid waste landfill meeting the new standards of Chapter 173-351 WAC. These wastes would have to be the subject of a consent decree and their disposal or treatment approved by Ecology as protective of human health and the environment.

- The U.S. Environmental Protection Agency is currently evaluating their definition of hazardous waste. It is very likely that in the coming years, some wastes formerly listed as hazardous will be "de-listed" and will be moved into the solid waste area. This includes contaminated media (soil or groundwater) associated with corrective action under hazardous waste regulations.

- Additional sources of waste for disposal in the solid waste infrastructure will occur from the regulatory reform process for the state *Dangerous Waste Regulations*, chapter 173-303 WAC. This process evaluated dangerous wastes that are regulated at a level beyond the federal definition of hazardous wastes. For these "state-only" wastes it was determined that, because of the more stringent requirements of the new state/federal regulations for municipal solid waste landfills, and with the proper handling, these wastes could be disposed of safely in MSW landfills.

MODERATE RISK WASTE

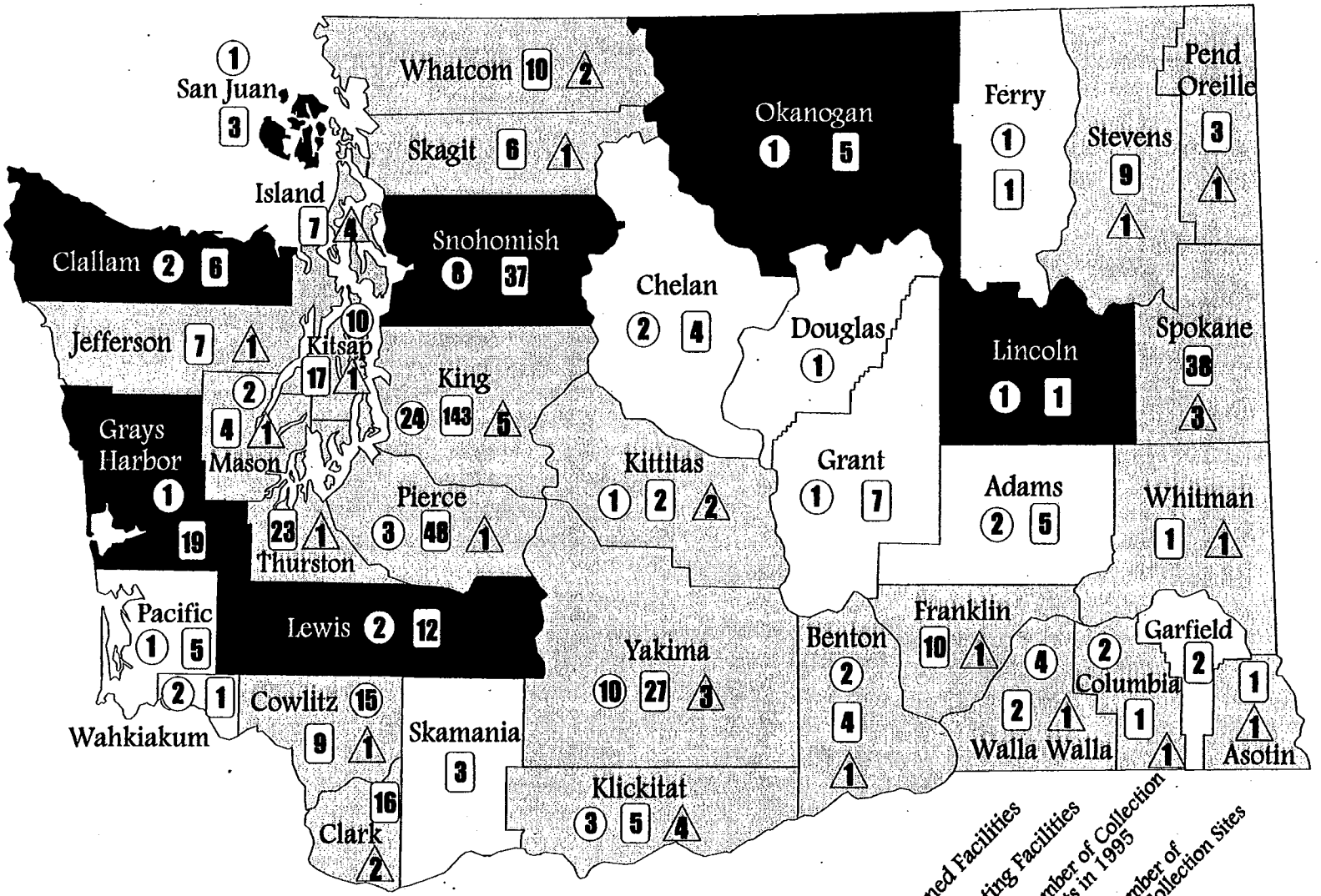
STATEWIDE SUMMARY OF MRW COLLECTION SYSTEM AS OF THE END OF JUNE 1996

Map C summarizes the Moderate Risk Waste (MRW) planned and current facilities in Washington at the end of June 1996. This includes operating MRW facilities, counties with multiple facilities and those that are planning to establish fixed facilities.

In 1995, there were 100 Moderate Risk Waste collection events including mobile collections. In 1994, there were 129 collection events. The reduction of collection events in 1995 was possibly due either to an increase in the number of facilities and or budget constraints. There are currently 40 operating facilities accepting Moderate Risk Waste statewide as compared to 35 in 1994. Figure 6.8 depicts MRW collection trends from 1993 through 1995.

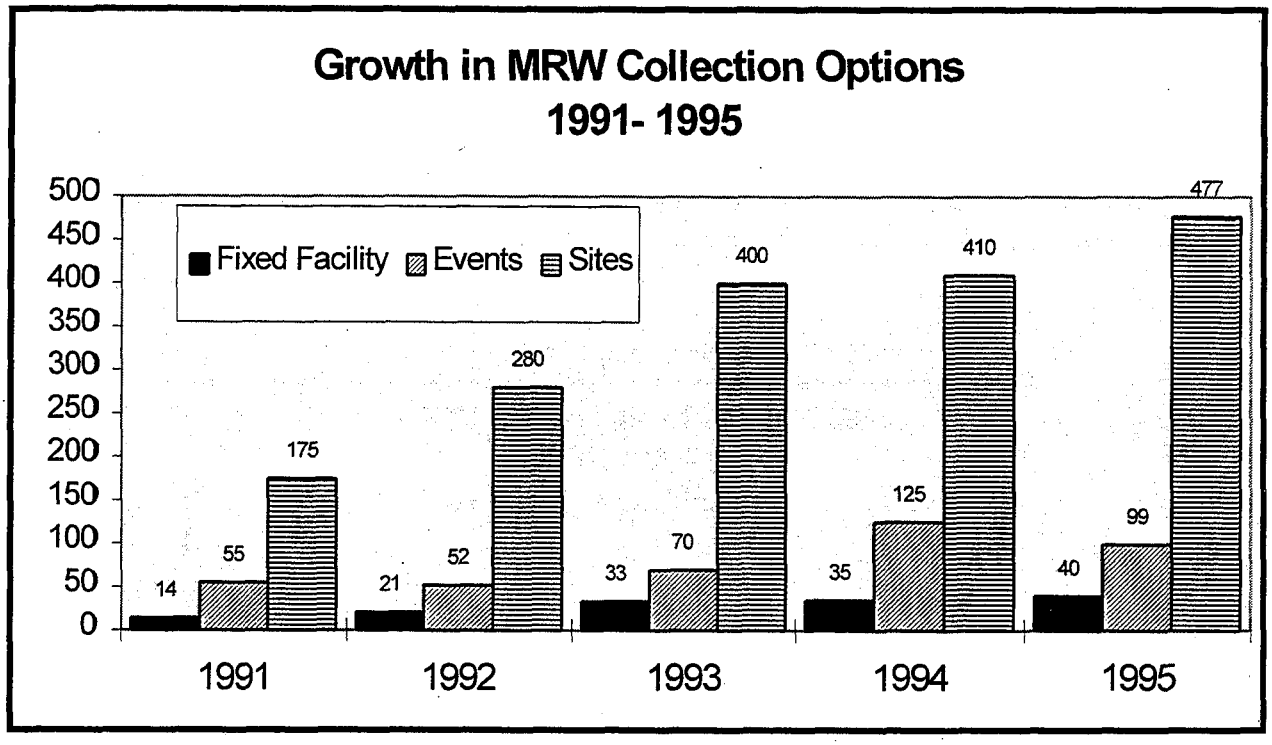
At the end of 1995, 22 counties had at least one operating Moderate Risk Waste facilities; seven of these counties have more than one facility. Some accept only household hazardous waste (HHW) while others accept HHW and Conditionally Exempt Small

MAP C: Existing and Planned MRW Collection Facilities October 1996



MRW facility is defined as a location where MRW is collected at least monthly.
Portions of Whatcom, Clark, Benton and Snohomish counties have curbside oil collection.

Figure 6.8
MRW Collection Trends



Quantity Generator (CESQG) wastes. Most also accept used oil. This includes public and private operations.

The used oil collection program continues to be one of the most popular programs of the MRW collection system. In 1995, a total of 9.9 million pounds of used oil was collected. In 1994, there were 470 used oil collection sites compared to 477 sites at the end of 1995.

Table 6.13 shows the results submitted by MRW quantities collected in 1995. The waste quantities are converted into pounds and segregated into four categories: Household Hazardous Waste (HHW), Oil Collection Centers, Conditionally Exempt Small Quantity Generator (CESQG) Waste, and Mixed Waste (programs that reported HHW and CESQG wastes together). For each waste type, the table shows final disposition of the waste by type and total amount.

The total of all MRW collected in 1995 was 16.8 million pounds. Approximately, 9.6 million pounds of waste were reported recycled or reused; 2.3 million pounds of MRW were collected and used for energy; about 4.3 million pounds went to hazardous waste disposal sites; and 0.5 million pounds were treated and landfilled.

The total amount of MRW collected in 1995 was approximately 5 million pounds more than what was reported in 1994. This may be due to a number of factors: an increase in the number of fixed facilities, a significant increase in the amount of used oil collected

approximately 2 million pounds and continued public education. The increase in the used oil collection may be a result of easy access and availability of collection sites.

Ecology continues to sponsor contaminated used oil collection program for facilities that accept oil from the public. About 25,000 pounds of household oil was reported as contaminated at the used oil collection centers in 1995. This represents less than 0.3% of the total used oil collected. A total of $30,000 was allocated for the 1995-97 bienium to assist local governments towards the disposal of contaminated used oil. Of that amount, there is a balance of $17,400, as of September 1996.

Figure 6.9
1995-97 Contaminated Used Oil Allocation

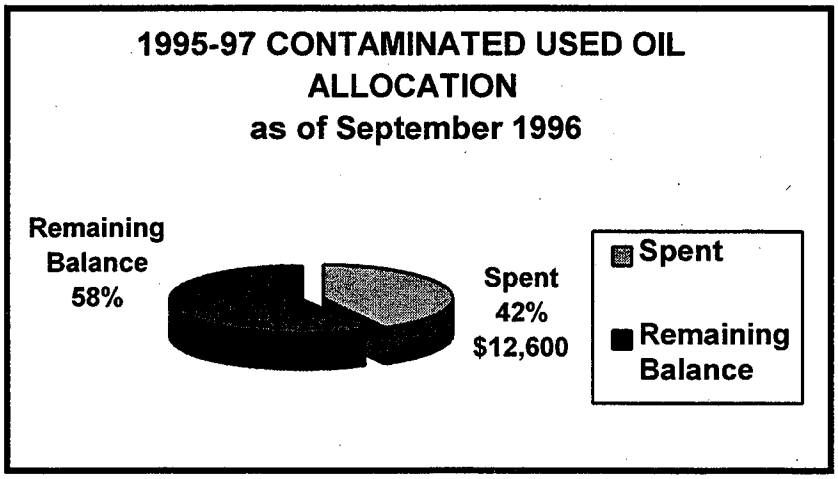


Table 6.13 MRW Quantities (pounds) Collected in 1995 by Waste Disposition and Waste Category

Waste Type (General)	Hazardous Waste Disposal	Recycled/ Reused	Energy Recovery	Treated/ Landfilled	Treated/ Wastewater	Other	TOTALS
CESQG							
Aerosols	448						448
Antifreeze	614	83					697
Corrosives	2,039						2,039
Flammable gas	480						480
Flammable liquids	2,900		67	130			3,097
Flammable solids	2		366				368
Oil	45	208					253
Oil (contaminated)	310						310
Other	318			1,917			2,235
Oxidizer	400						400
Paint (latex)	3,645			833			4,478
Paints (other)	975						975
Paints oil based	26,369		1,083	90			27,542
Pesticides/preserv	80			413			493
Solvents	796						796
TOTAL	**39,421**	**291**	**1,516**	**3,383**			**44,611**
HHW							
Adhesives	14,000						14,000
Aerosols	13,269						13,269
Antifreeze	84,448	151,838	800			2,400	239,486
Cfc/freon		60					60
Corrosives	51,451		597	4,343	25,056	480	81,927
Dangerous when wet	0						0
Dry cell batteries	162,627	2,430		3,735			168,792
Flammable gas	1,417	97,195	608			25	99,245
Flammable liquids	833,045	276,671	17,500	1,350		370	1,128,936
Flammable solids	19,156		5,912				25,068
Lead-acid batteries	69,893	355,978	18				425,889
Oil	35,368	286,771	70,707				392,846
Oil (contaminated)	35,143	2,627	1,222	101,831		407	141,230
Oil filters	3,187	7,093		0			10,280
Organic peroxide	486						486
Other	330,394	97,290	1	120			427,805
Oxidizer	10,513		2,657	4,155			17,325
Paint (latex)	1,040,879	388,453		295,901		3,280	1,728,513
Paints (other)	460,355			3,432			463,787

Table 6.13 MRW Quantities (pounds) Collected in 1995 by Waste Disposition and Waste Category

Waste Type (General)	Hazardous Waste Disposal	Recycled/ Reused	Energy Recovery	Treated/ Landfilled	Treated/ Wastewater	Other	TOTALS
Paints oil based	740,710	398,065	39,206	7,790			1,185,771
Pesticides/preserv	107,822	2	36,920	8,395		142	153,281
Solid waste	297						297
Solvents	11,365						11,365
Toxic metals	2,068	758		600			3,426
TOTAL	**4,027,893**	**2,065,231**	**176,148**	**431,652**	**25,056**	**7,104**	**6,733,084**
MIXED							
Antifreeze		23,242					23,242
Corrosives	1,560					415	1,975
Dry cell batteries	21,875			469			22,344
Flammable gas	500						500
Flammable liquids	69,300						69,300
Flammable solids	7,700						7,700
Lead-acid batteries		254,090					254,090
Oil	115,329		1,628				116,957
Oil (Contaminated)	814						814
Oil filers		63		0			63
Other		13,480	10,200				23,680
Oxidizer	900						900
Paint (latex)	22,960	1,600		68,360			92,920
Paints oil based	26,800		23,780				50,580
Pesticides/preserv	5,333						5,333
Toxic metals	10						10
TOTAL	**273,081**	**292,475**	**35,608**	**68,829**		**415**	**670,408**
OIL COLLECTION CENTERS							
Antifreeze		57,552					57,552
Oil		7,221,438	2,120,970				9,342,408
Oil filters		4,000		6,250			10,250
TOTAL		7,282,990	2,120,970	6,250			9,410,210
1995 TOTALS	**4,340,395**	**9,640,987**	**2,334,241**	**510,114**	**25,056**	**7,519**	**16,858,312**
1995 OIL COLLECTED = 9,852,463			**1994 OIL COLLECTED =**		**7,870,293**		

APPENDIX A

SOLID WASTE FACILITIES IN WASHINGTON

BY COUNTY

Table A-1 Solid Waste Facilities In Washington Permitted Under Chapter 173-304 WAC or Chapter 173-351 WAC

(as of October 1996)

	LANDFILLS					INTERMEDIATE										
COUNTY	MSW LANDFILLS	WOOD WASTE LANDFILLS	INERT/DEMOLITION LANDFILLS	LIMITED PURPOSE LANDFILLS	ASH MONOFILLS	BALE STATION	COMPACTING STATION	COMPOST FACILITY	DROP BOXES	PILES	RECYCLING FACILITIES	SURFACE IMPOUNDMENTS	TRANSFER STATIONS	MRW FIXED FACILITIES	TIRE PILES	INCINERATORS	OTHER
ADAMS													2				
ASOTIN	1		1														
BENTON	1		1						1				1	1			
CHELAN			2								1		3				
CLALLAM	1			2				1		1			2				1
CLARK				2									3	1			
COLUMBIA													1				
COWLITZ	1	1		1													
DOUGLAS	1												1				
FERRY													1				
FRANKLIN	1												1				
GARFIELD			1										1				
GRANT	2								15								
GRAYS HARBOR		2	1	2									6				
ISLAND			1				2				3		2	4			
JEFFERSON			1	1					5				1	1			
KING	2							5	2		1		11	5			
KITSAP	1	1	1					1	5		2			1			
KITTITAS	1									1		1	2				
KLICKITAT	1				1				2				2		1		
LEWIS			1						8				3				
LINCOLN				1							1						
MASON		2		1					3				1				
OKANOGAN	1	1											2				
PACIFIC									2				2				
PEND OREILLE									1				2				
PIERCE	3		2	3				2	1				7			1	
SAN JUAN									2			2					
SKAGIT							5	4	1				1	1			
SKAMANIA								1					3				
SHOHOMISH		4	1					5	6		1		3				1
SPOKANE	1		4	1				3		1		1	4	1		2	1
STEVENS	1			1									4				
THURSTON	1								3		1						
WAHKAIKUM									1								
WALLA WALLA	1							1									
WHATCOM		2	1	2				1	6		4		4	2		2	1
WHITMAN			1	1				1			1						
YAKIMA	2		2					2	7	2			2				1
TOTAL	23	13	21	18	1	0	7	27	71	5	15	4	78	17	1	5	5